FOOD MANUFACTURE

A PUBLICATION OF THE LEONARD HILL TECHNICAL GROUP MAY 1, 1960

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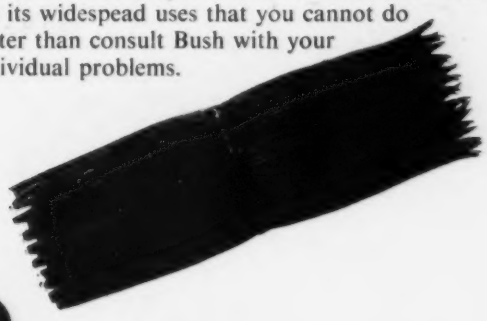
MEXICO

discovered Vanilla Beans

Discovery is not enough. Credit is due also to those who utilise nature's raw materials. It is so with Vanilla Beans, whether they come from Mexico, Reunion, Madagascar, Comoro Islands or elsewhere. For over a century the House of Bush has developed Vanilla Essence and such are its widespead uses that you cannot do better than consult Bush with your individual problems.



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Just 6d worth of Vanillin Monsanto flavours 1 cwt of chocolate

Because of its high degree of concentration, only minute quantities of Vanillin Monsanto are required to give the desired vanilla flavour to chocolate, confectionery, custard powder, ice cream and other foodstuffs.

Vanillin Monsanto is available in crystal, needle crystal and powder form.

ETHAVAN (Monsanto's Ethyl Vanillin) is a more concentrated flavour, about 3 times as strong as Vanillin.

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Titled Vanillin Monsanto, this booklet gives you details of methods of use and recommended concentrations, as well as valuable technical information.

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The largest range of Food cutting and preparing machines in the world

1

THE FOODTECH CUT MIXER

High speed (1,000–4,400 r.p.m.) heavy duty chopper and emulsifier. Accepts any kind of frozen meat or fish, cuts cleanly into particles (coarse cut), or produces a smooth emulsion. Also chops and blends fruit, vegetables and butter. Capacity up to 800 lb.

2

THE UNIVERSAL KS MINCE-MASTER

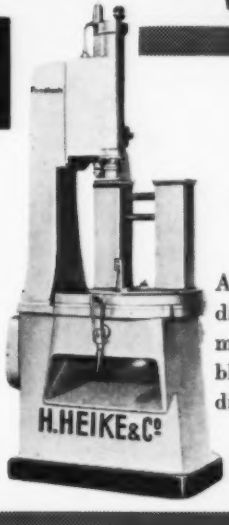
Over 200 satisfied users of this machine in the U.K. alone. Accepts *all* foodstuffs—even the toughest—and reduces in seconds to a smooth, uniform mix that remains consistent for more binding power and better colour.

3

THE FOODTECH MINCER

High speed fully automatic mincer, output up to 6 tons per hour: smaller models in many sizes.

4



THE FOODTECH DICER

A robust, heavy-duty dicer that will cut frozen meat, fat and vegetables into cubes of exact dimensions.

5

FACTORY LAYOUT

Foodtech's Managing Director, Mr. P. H. Hilgeland, is an expert in this field and will gladly advise you. Whether you are installing one machine or equipping a new factory please contact him. You will incur no obligation.

Foodtech Ltd.

581a and 581b GREEN LANES, HARRINGAY, LONDON, N.8

Telephone: MOUntview 2226

Index to ADVERTISERS

	Page
Abbey Display Ltd.	Sept.
Abisch Conveyor & Furnace Co. Ltd.	A79
Acalor (1948), Ltd.	Dec.
Advita	April
Agricultural & Chemical Products, Ltd.	A94
Aiton & Co., Ltd.	April
Albrin Products, Ltd.	A66
Albro Fillers & Engg. Co., Ltd.	April
Alexandra Separators, Ltd.	Mar.
Alfa-Laval Co., Ltd.	A11
Allen Harrison & Co., Ltd.	Oct.
Allen, Stafford, & Sons, Ltd.	A55
Alloa Glass Works Co., Ltd.	April
Allspeeds, Ltd.	April
Amasal, Ltd.	A84
Amber Oils, Ltd.	April
A.P.V., Ltd.	Cover 3
Ashworth Ross & Co.	Dec.
Associated Metal Works	A80
Atcost, Ltd.	Sept.
Baker Perkins, Ltd.	April
Barron, W. S., & Son, Ltd.	April
Barry Wehmiller Co., Ltd.	A33
Beddington Nut & Produce Co., Ltd.	A92
Begg, Cousland & Co., Ltd.	April
Bellingham & Stanley, Ltd.	April
Benjamin Electric, Ltd.	A13
Bennett, Sons & Shears, Ltd.	Dec.
B.E.N. Patents	April
Birlec, Ltd.	Feb.
Bland, A. H., Ltd.	April
Blaw Knox Chemical Eng. Co., Ltd.	A65
Bliss, E. W. (England), Ltd.	A49
Boehm, Fredk., Ltd.	A5
Boulton, William, Ltd.	April
Brammer, H., & Co., Ltd.	Nov.
Bramwell, S., & Co., Ltd.	A73
Brierley, Wm., Collier & Hartley, Ltd.	A91
British Belting & Asbestos, Ltd.	A59
British Cellophane, Ltd.	April
British Hydrological Corporation	A63
British Nylon Spinners, Ltd.	Mar.
British Sidac, Ltd.	April
British Soya Products, Ltd.	A80
British Steam Specialities, Ltd.	Feb.
British Thomson-Houston Co. (Rugby)	Nov.
Broadbent, Thomas, & Sons, Ltd.	A61
Brown & Polson, Ltd.	April
Bryan, Wm., Ltd.	A83
Bulmer, H. P., & Co., Ltd.	Dec.
Bush, W. J., & Co., Ltd.	Cover 1
Busse, Paul	A92
Butterfield, W. P., Ltd.	April
Butterley Co., Ltd.	Feb.
Caleb Duckworth, Ltd.	A62
Calfos, Ltd.	A83
Cambridge Instrument Co., Ltd.	A6
Cashmore, John, Ltd.	April
Caxton Chocolate Co., Ltd.	April
Clark, George, & Sons (Hull), Ltd.	A15
Clarke-Built, Ltd.	Nov.
Clarke, George, & Co., Ltd.	April
Coates Bros., Inks, Ltd.	Mar.
Collis, J., & Son, Ltd.	April
Colt Ventilation, Ltd.	A36
Commer Cars, Ltd.	A16
Conder Eng. Co., Ltd.	Feb.
Cooper, McDougal & Robertson, Ltd.	Aug.
C.P. Equipment, Ltd.	A77
Crofts (Engineers), Ltd.	April
Crompton Parkinson, Ltd.	A69
Crookes Laboratories, Ltd.	A70
Cuxson, Gerrard & Co., Ltd.	A82
Dallow, Lambert & Co., Ltd.	April
Daniels, S., & Co., Ltd.	A86
Dawson Bros., Ltd.	A22
De Havilland Propellers, Ltd.	A23
Demby, Hamilton, & Co., Ltd.	A42
Denton Edwards Paints, Ltd.	A34
Deutscher Innen	Mar.
Dodge Bros. (Gt. Britain), Ltd.	April
Dodman, Alfred, & Co., Ltd.	A85
Douglas, Charles E., & Co.	Sept.
Drakesons	A94
Duche, T. M., & Sons, Ltd.	April
Electropower Gears, Ltd.	Nov.
Elliott Bros. (London), Ltd.	April
Endecotts (Filters), Ltd.	A84
Evans, W., Co., Ltd.	A76
Evershed & Vignoles, Ltd.	April
Evode, Ltd.	Dec.
Ewart Chainbelt Co., Ltd.	A87
Fielden Electronics, Ltd.	Nov.
Fischer & Porter, Ltd.	A78
Fisher's Foils, Ltd.	April
Flexibox, Ltd.	A68
Florasynth Laboratories (England), Ltd.	Mar.
Follsain-Wycliffe Foundries, Ltd.	Nov.
Foodtech, Ltd.	A3
Foster Instrument Co., Ltd.	A28
Fraser, J., & Son, Ltd.	A86
Freeman, Taylor Machines, Ltd.	A90
Frigidaire Division of General Motors, Ltd.	A8
Fuller Horsey, Sons & Cassell	A92
Gas Council	Mar.
General Electric Co., Ltd.	Nov.
Glacier Metal Co., Ltd.	Feb.
Glass Manufacturers Federation	A10
Goblin (B.V.C.), Ltd.	A76
Gosheron, John, & Co., Ltd.	Nov.
Greening, N., & Sons, Ltd.	A81
Grill Floors	Dec.
Gunson, R. W., (Leeds), Ltd.	A79
Haas Vakuum-Technik G.m.b.H.	April
Hanover Fair	Mar.
Harris, F. & R. M., (B'ham), Ltd.	April
Hart, W. J., Ltd.	A89
Heston Equipment Co., Ltd.	Mar.
Higginbottom, A. E., Co., Ltd.	April
High Duty Alloys, Ltd.	A35
Hodgkinson, James, (Salford), Ltd.	Oct.
Hodgson, Richard, & Sons, Ltd.	April
Holdan Engineers (London), Ltd.	Mar.
Holmes, W. C., & Co., Ltd.	A12
Honeywell Controls, Ltd.	A72
Hopkinson, Ltd.	A91
Howard Pneumatic Engg. Co., Ltd.	A30
Hughes, F. A., & Co., Ltd.	Dec.
Hughes, George H., Ltd.	Dec.
Hunt, John, (Bolton), Ltd.	A62
I.C.I.	A25, A45
Industrial & Commercial Finance Corporation Ltd.	April
IMC S.A. International Machinery Corporation	A50, A51
Isopad Ltd.	Mar.
I.S.I.S., Ltd.	A97, A98

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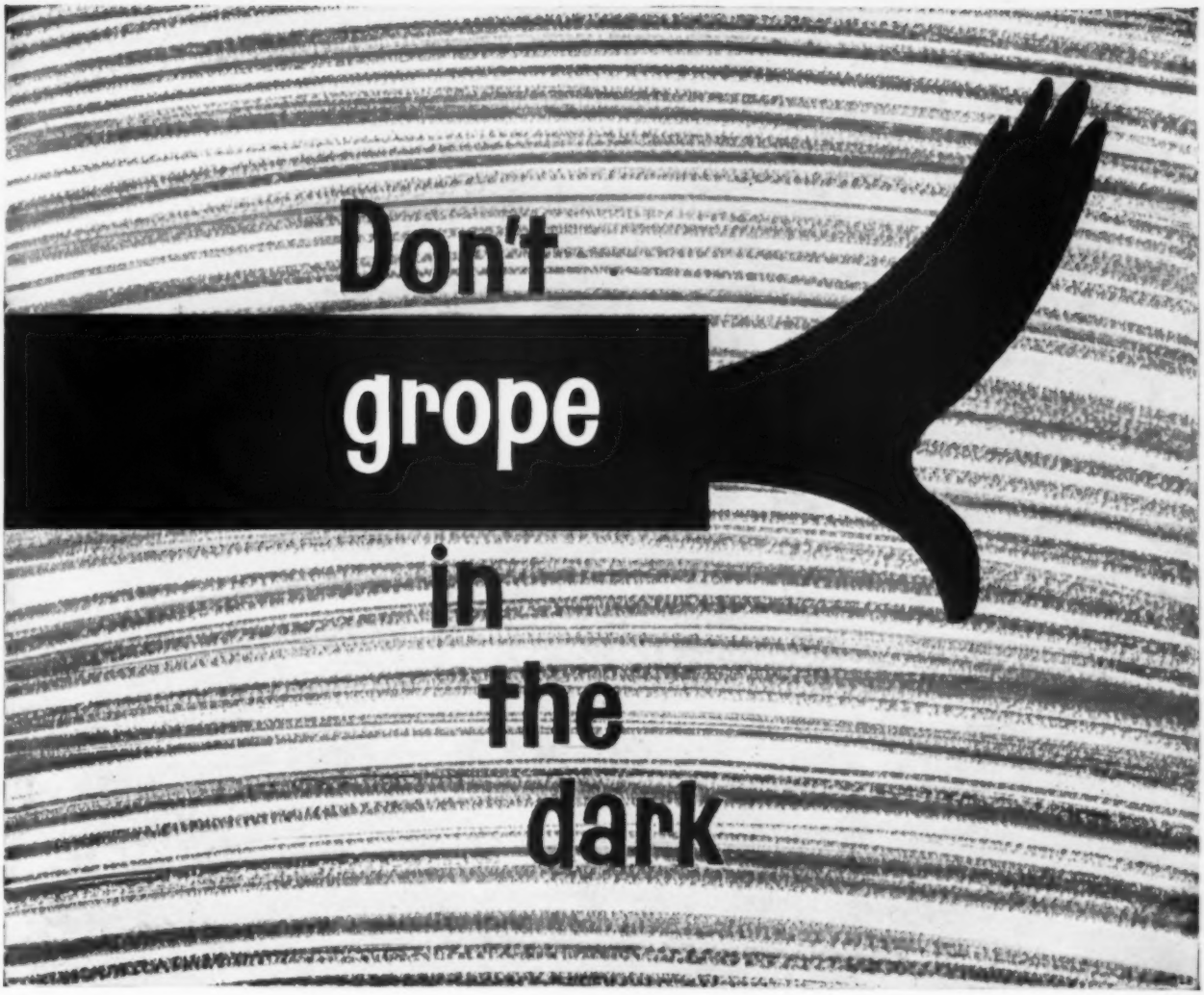

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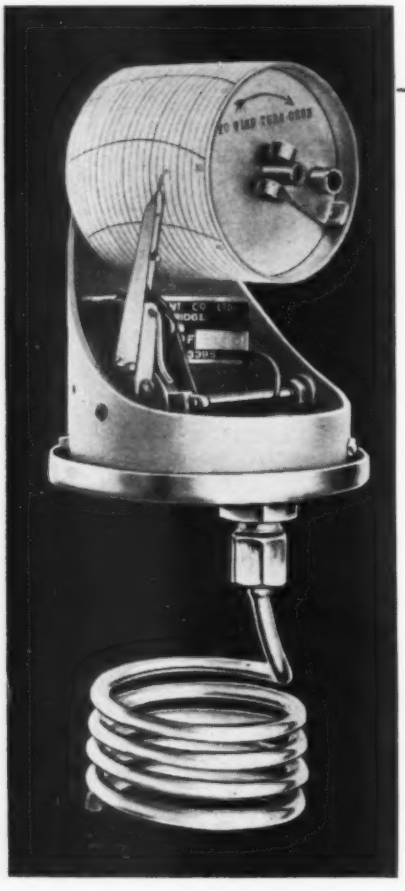
ADDITIONAL INFORMATION ON THESE PRODUCTS IS CONTAINED IN OUR BROCHURES.

Index to ADVERTISERS

	Page
Jackson Bros. (Knottingley), Ltd.	A41
Jackson, J. G., & Crockatt	April
Jenner, A. & C., Ltd.	April
Johnson, A., & Co. (London), Ltd.	A9
Johnson, S. H., Co., Ltd.	April
Jones, Samuel, & Co., Ltd.	A43
Jowett, Angus	Oct.
Karrier Motors, Ltd.	Mar.
Kellie, R., & Son, Ltd.	A57
Kemball Bishop & Co., Ltd.	April
Kendall, F., & Sons, Ltd.	A92
Kestner Evaporator & Engg Co., Ltd.	Mar.
Key Glassworks, Ltd.	April
King, George W., Ltd.	A14
Kingston upon Hull Development Committee	April
Klaxon	Dec.
Kork-n-Seal, Ltd.	Cover 4
Kustner Bros. & Co., Ltd.	Dec.
Lambert, L., & Co., Ltd.	April
Leverton Myers	Mar.
Levertons of Leeds, Ltd.	Mar.
Light Alloy Construction, Ltd.	Dec.
Loders & Nucoline, Ltd.	A74
Manesty Machines, Ltd.	April
Manger, J., & Son, Ltd.	Sept.
Manufacturers Equipment Co., Ltd.	A75
Marshall Sons & Co., Ltd.	A48
Mason & Morton, Ltd.	A80
Mather & Platt, Ltd.	April
May & Baker, Ltd.	A87
Mechanical Handling Exhibition	Mar.
Measurement, Ltd.	April
Medway Paper Sacks, Ltd.	Feb.
Metal Box Co., Ltd.	A19, A26
Metal Closures, Ltd.	A39
Metal Propellers, Ltd.	A86
Milk Products (N.Z.), Ltd.	A44
Mittelhauser & Walter	April
Mono Pumps, Ltd.	A81
Monsanto Chemicals, Ltd.	Cover 2
Muller, Reinhold	April
Munton & Fison, Ltd.	A24
Myers, Fred., Ltd.	A7
National Glass Works (York), Ltd.	A37
Negretti & Zambra, Ltd.	A32
New Welbeck, Ltd.	A90
Newman, William, & Sons, Ltd.	Dec.
Nichols, J., & Son, Ltd.	Feb.
Nipa Laboratories, Ltd.	Mar.
Norman Engg. Co.	April
Northern Cold Storage	Sept.
Northide, Ltd.	Mar.
Oppenheimer Casing Co. (U.K.), Ltd.	April
Oxoid Division of OXO Ltd.	A40
Packaging Machinery (Peters), Ltd.	Nov.
Padley & Venables, Ltd.	A38
Parsons, S., & Co., Ltd.	Feb.
Permoglaze, Ltd.	A60
Permutit Co., Ltd.	Dec.
Plenty & Son, Ltd.	A29
Polak & Schwarz (Eng.), Ltd.	April
Porteus, G., & Sons, Ltd.	Dec.
Powell Duffryn Eng. Co., Ltd.	Mar.
Premier Filterpress Co., Ltd.	April
Progress (Universal), Ltd.	Dec.
Pulsometer Engg. Co., Ltd.	Dec.
Purdy Machinery Co., Ltd.	Dec.
Rampart Inks, Ltd.	Jan.
Rayner & Co., Ltd.	A20
Reads, Ltd.	Sept.
Realm Engg. Works, Ltd.	A89
Remploy, Ltd.	A71
Roche Products, Ltd.	A4
Rozalex, Ltd.	A88
Russell Construction	Nov.
Samuelson, P., & Co.	A77
Sandvik Steel Band Conveyors, Ltd.	Dec.
Saunders Valve Co., Ltd.	April
Sauven Perforating Machine Co., Ltd.	April
Scan, Ltd.	A65
Sellotape, Ltd.	April
S.G.B. (Dudley), Ltd.	April
Sharples Centrifuges, Ltd.	April
Sierex, Ltd.	Oct.
Signode, Ltd.	A53
Silverson Machines, Ltd.	Nov.
Simon, Henry, Ltd.	A54
Skerman, C., & Co., Ltd.	A94
SMALL ADVERTISEMENTS	A93—AA96
Smith & Nephew, Ltd.	Aug.
Smiths Insulations, Ltd.	June
Soya Foods, Ltd.	AA2
Spencer-Bonecourt-Clarkson, Ltd.	Dec.
Spesco Development, Ltd.	A64
Stainless Steel Plant, Ltd.	A67
Stainless Steel Pumps, Ltd.	Mar.
Stanmil Company, The	Jan.
Steel Co. of Wales, Ltd., The	A46
Stevenson & Howell, Ltd.	A85
Stokes & Dalton, Ltd.	A17
Sturge, J. & E., Ltd.	A47
Taylor Rustless Fittings Co., Ltd.	A84
Technoexport	April
Temple Press, Ltd.	A64
Thames Board Mills, Ltd.	A31
Thomas, Richard & Baldwins, Ltd.	April
Thompson, John, Ltd.	April
Tool Treatments	Oct.
Trapow, D., & Co., Ltd.	Jan.
Trist, Ronald, & Co., Ltd.	Dec.
Turner, E. R. & F., Ltd.	A90
Tylors of London, Ltd.	Feb.
Ultrasonics, Ltd.	Nov.
Union Food Machinery and Equipment, Ltd.	A88
United Glass, Ltd.	A21
Uni-Tubes, Ltd.	Nov.
Universal Metal Products, Ltd.	Oct.
Varley-FMC, Ltd.	Sept.
Vauxhall Motors, Ltd.	A18
Viscose Development Co., Ltd.	April
Viskase, Ltd.	Jan.
Vitamins, Ltd.	A60
Vulcan Foundry, Ltd.	A58
Warwick Production Co., Ltd.	April
Webster, Isaac, & Sons, Ltd.	June
Welch, J. A., Ltd.	A56
Wetter, J. C., & Co., Ltd.	April
White, Tomkins & Courage, Ltd.	April
Whittaker, Arthur	A94
Willcox, W. H., & Co., Ltd.	A88
Williams (Hounslow), Ltd.	Mar.
Wilts United Dairies, Ltd.	Mar.
Worthington Simpson, Ltd.	A52
Wright Hargreaves, Ltd.	A27
Wynmouth Lehr & Co., Ltd.	A92
Youngman, W. C., Ltd.	A92
Zimmermann, C.	April



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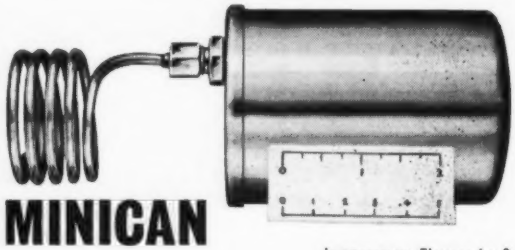
. . . the pocket-sized temperature recorder, is your inspector and your guardian, right through the process. It can be sited in cooking vessels of all sizes, on lorries hauling perishable goods, in sterilising processes—anywhere where there are a few cubic inches of space. The bulb may be sealed in a tin or bottle and the complete instrument passed along a conveyor, providing a continuous record on the chart of the process temperature.

Temperatures of bulk mixtures may be continuously recorded by a number of Minican Recorders placed in strategic positions throughout a series of processes, e.g. heating, cooking and cooling.

Food Inspectors and those responsible for checking and recording temperatures of a number of installations will appreciate its compactness and light weight.

Send for List P15R. For future publications, ask for Mailing Form R/3/60.



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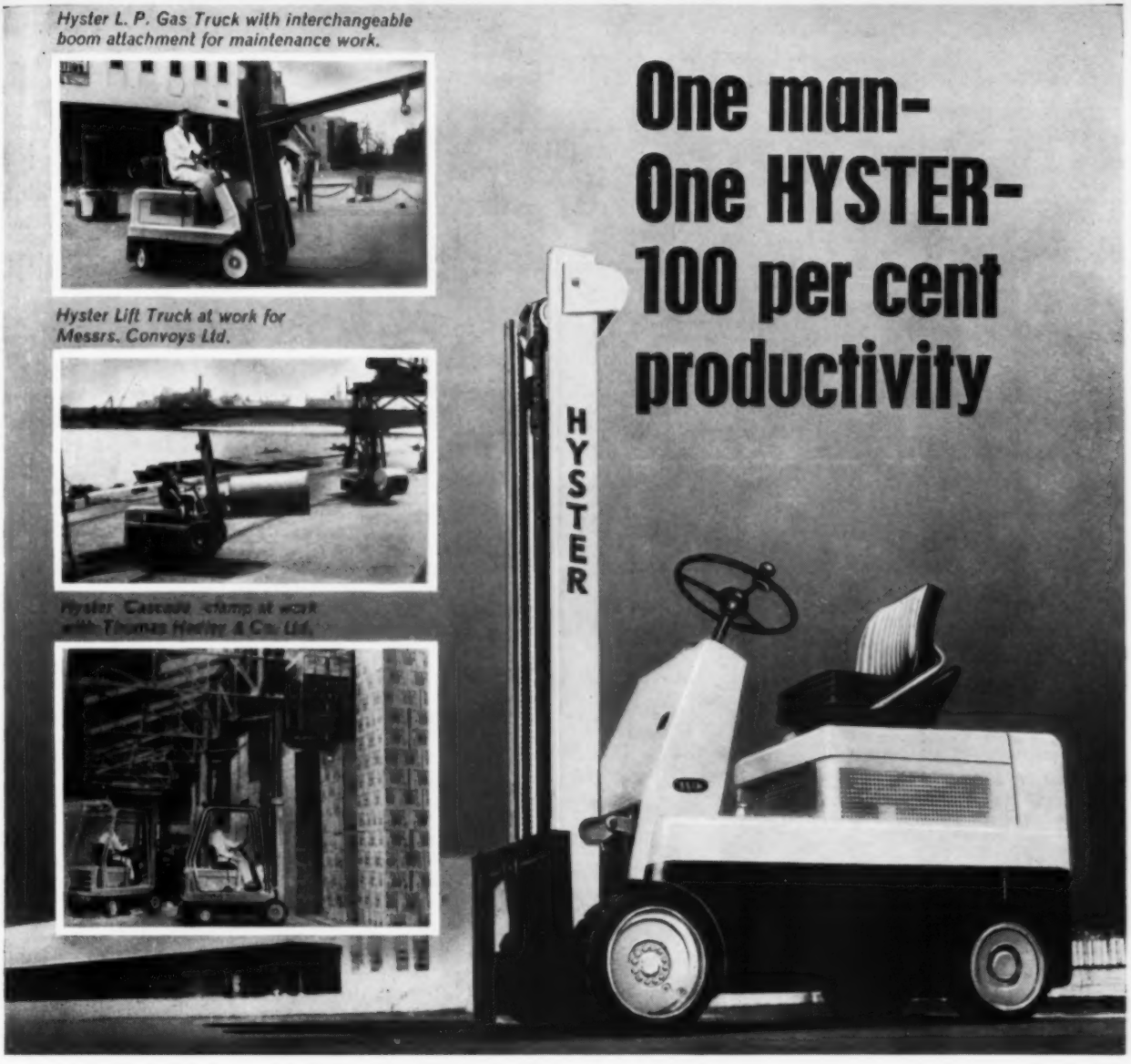
Instruments, Electronics & Automation Exhibition, Olympia, 23-28 May, 1960. Visit Stand No. F 259. Tickets available from Cambridge Instrument Company Ltd.

Hyster L. P. Gas Truck with interchangeable boom attachment for maintenance work.

Hyster Lift Truck at work for Messrs. Convoys Ltd.

Hyster Cascade clamp at work with Thomas Hedley & Co. Ltd.

One man— One HYSTER— 100 per cent productivity



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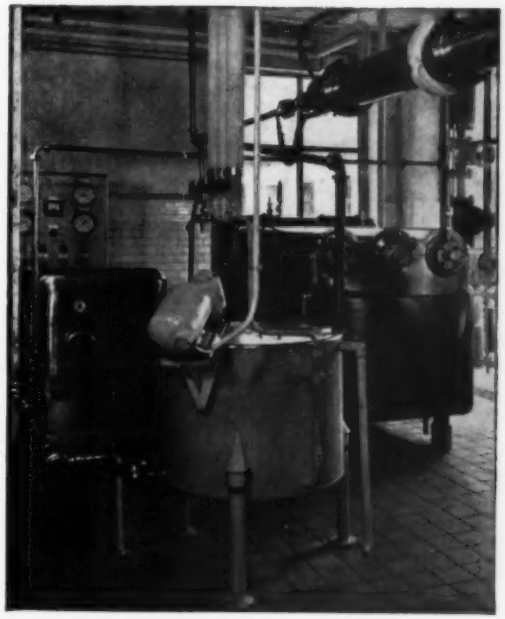
Norway Chooses the best



Balance Tank, Votator Pump and Votator "A" Unit.

Votator Resting Tube linked up to Packing Machine via a Johnson Constant Pressure Buffer Unit.

Photo by courtesy of Messrs. Dag-ny Margarin—Fabrikk A/S Pilestredet 75c. Oslo, Norway.

WITH THE

★ Votator *continuous* PROCESSING APPARATUS

Norway, one of the greatest margarine producing countries, chooses Votator Apparatus because . . . it requires only a fraction of the operating staff to give a similar output by ordinary methods . . . requires virtually no supervision . . . gives a superior texture and finish to the resultant product, with consistent uniformity . . . fulfils the highest standards of hygiene: the margarine arrives at the packing machines entirely untouched by hand via the Johnson Constant Pressure Buffer Units.
Votator Continuous Processing Apparatus is in use all over the world for the automatic and economical production of MARGARINE, LARD, MARSHMALLOW, SOUPS, SAUCES, GELATINE, TURKISH DELIGHT, STARCH JELLY, BISCUIT CREAM, and many other well-known foods and sweets.

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Ask for the services of our Process Engineers and fully equipped Votator Laboratory for developing new applications or improving existing ones for continuous heating, cooling, crystallising, etc., of viscous or liquid materials by closed-processing plant.

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GLASS CONTAINER MANUFACTURERS INTRODUCE

FREE

Container-acceptance Testing Service

A new service designed to help Packers

Britain's Glass Container Manufacturers have introduced a new and forward-looking service for the packing industry. Appreciating that a need existed for a service to enable Packers to test in advance consumer acceptance of any new pack, they have set up a Container-acceptance Testing Service. This new service will furnish any Packer with facilities to test new packs in any one, or all four, of the following progressive stages:— 1. Design Preference Testing, 2. Container In Use Testing, 3. Shelf Testing, 4. Area Test Marketing.

Free Service

Because the glass manufacturers believe that this service should be used as widely as possible, all the facilities under headings 1, 2 and 3 are offered quite freely as a service to the packing industry. The only cost to the Packer under these headings will be in the supply of goods, containers and such items as labels and transport. In the case of Area Test Marketing schemes, however, a nominal charge will be made for planning the operation.

Security

Where any of these tests are carried out on new products, the whole operation can be executed with absolute security if this is desired. Packers can have complete anonymity by employing one of several brand names that have been registered especially for this purpose.

If you would care to have further details of this service, please do not hesitate to ask, irrespective of whether your interest is immediate or not. Your Glass Container Manufacturer will be happy to discuss your problem and to help you in any way. Details of the operation of the scheme have been published as a booklet, copies are available on request.

1. DESIGN PREFERENCE TESTING

Facilities are available to pre-test the appeal and acceptability of new container designs on a consumer panel of 400 households in London, Birmingham, Manchester and Glasgow. From this panel a balanced sample can be drawn to match the known, or probable, consumer market for the product. The panel's reactions to the design will be recorded, analysed and presented to the Packer as a report and recommendation.

2. CONTAINER IN USE TESTING

The consumers' attitude towards the new pack can be carried a step further than ascertaining the appeal of the design only. Any new glass container and the product for which it is designed can be tested in actual home use by the consumer panel. Their experience of how the pack measures up to the requirements of use in the home will be recorded, analysed and presented to the Packer as a report and recommendation.

3. SHELF TESTING

The sales appeal of a new design can be tested under actual store conditions. The pack will be placed on the shelves or counters of a number of self-service or other stores in the main centres of population. The speed and volume of off-take will be recorded and analysed by class of store and locality. The packed product can be tested either alone or in competition with any other alternative or existing pack.

4. AREA TEST MARKETING

Because the pack and product testing service is so closely associated with marketing, it was felt that a service which linked the two operations would furnish Packers with a valuable additional service. To this end an expertly staffed marketing service has been established which will plan, organise, and if desired, execute test market campaigns in their entirety, on behalf of any Packer wishing to launch a new glass packed product.

SEE HOW GOOD THINGS ARE IN GLASS

THIS IS AN ADVERTISEMENT OF THE GLASS MANUFACTURERS' FEDERATION · 19 PORTLAND PLACE LONDON W1 · LANGHAM 6952

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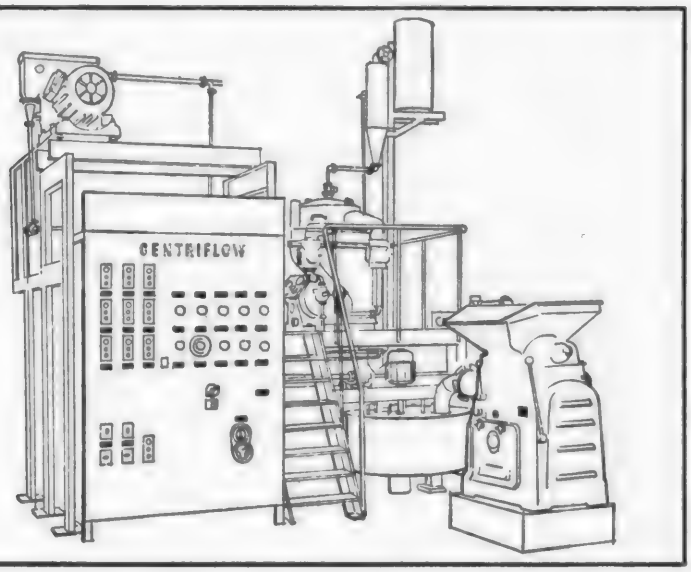
CENTRIFLOW
FOR ANIMAL FATS

HIGHER YIELD OF BETTER FAT AT LOWER COST



Mincer
Capacities from
½ to 4 tons/hr.

IMPARTIAL EXPERTS PREFER CENTRIFLOW PROCESSED FATS

A famous packers' research institute recently tested the product of Centriflow plant run by one of their members and rates it as follows (on a scale of 1 to 10):

Colour	9	**Taste**	9
Smell	9	**Consistency**	10
TOTAL SCORE (out of a possible 40)			37

This is the highest rating ever given by the institute referred to and compares well with their minimum export rating of 22. It is now recommending the Centriflow process to all its members.

HE PUTS THROUGH 3,300 LBS/HOUR – ALONE

A continuous process with mechanical disintegration and De Laval Centrifugal Separation. Yields up to 99.5% of fat makes you competitive in any market.

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De Laval complete plants giving the most up-to-date techniques are available for:

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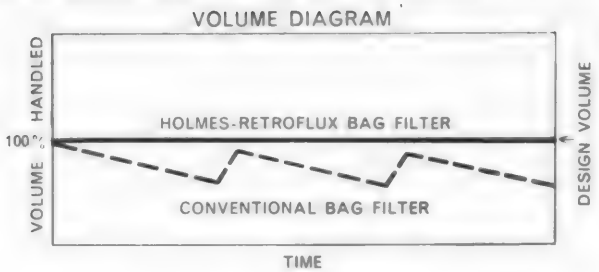
Smee's DL430

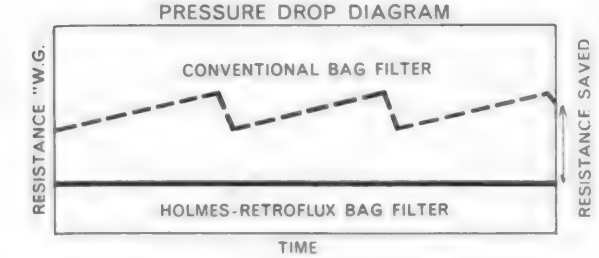
Holmes-Retroflux Bag Filters

The Holmes-Retroflux Bag Filter is of advanced design and offers numerous advantages for those applications where high dust burdens are encountered and/or dusts of an adhesive nature have to be collected.

A Retroflux Bag Filter installation collecting valuable dust at a chemical works.

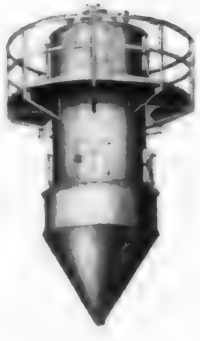
THE FILTER THAT WORKS AT CONSTANT PRESSURE AND AIR VOLUME





- **Constant low resistance— reduced power consumption.**
- **Constant volume of extraction.**
- **Long life filter bags— no friction or wear and tear.**
- **Low maintenance costs— no shaking or valve mechanisms.**
- **Continuous cleaning of entire surface area of filter bags.**
- **Efficiency—in excess of 99% for all particles.**

Holmes-Standard Bag Filters are also available and are recommended for less arduous duties.



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As the basis for new and ever more ingenious lighting arrangements, 'Flo-line' fittings open up for the lighting specialist tremendous opportunities for developing new business.

BENJAMIN REGD. FLO-LINE

for those who design with light

'Flo-line' combines the outstanding efficiency of Benjamin fluorescent lighting with exciting and original design of an outward simplicity, making for easy harmony with decorative schemes.

The minicell louvre is combined in one unit with translucent side panels to make an all plastic diffuser of entirely new characteristics.

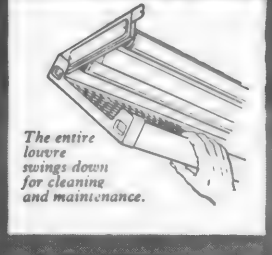
Comfortable yet cheerful seeing conditions are ensured, with high illumination values.

Controllable upward light. Ceiling or pendant mounting. Access to lamps and control equipment is quick and easy. Side panels are double walled for strength.

Apparent depth of fitting only 3½ in. Total depth 4¾ in. Half inch cube spaces in louvre give 45° cut-off.

Installation accessories include couplers for continuous line arrangements and channel junction boxes for geometrical layouts.

Uses 2 x 5 ft. 80-Watt lamps.
Quick or switch start control gear.



The entire louvre swings down for cleaning and maintenance.

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BRITISH LIGHTING COUNCIL BLC MEMBER

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A COMPLETE RANGE TO SUIT ALL NEEDS

CAPACITIES	SPEEDS	PRICES *
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* Prices for all My-te-Min Mark II models include new-type pendant mains reversing "Snip-Snap" push button control and Slack Chain Collecting Box.

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FORWARD CONTROL
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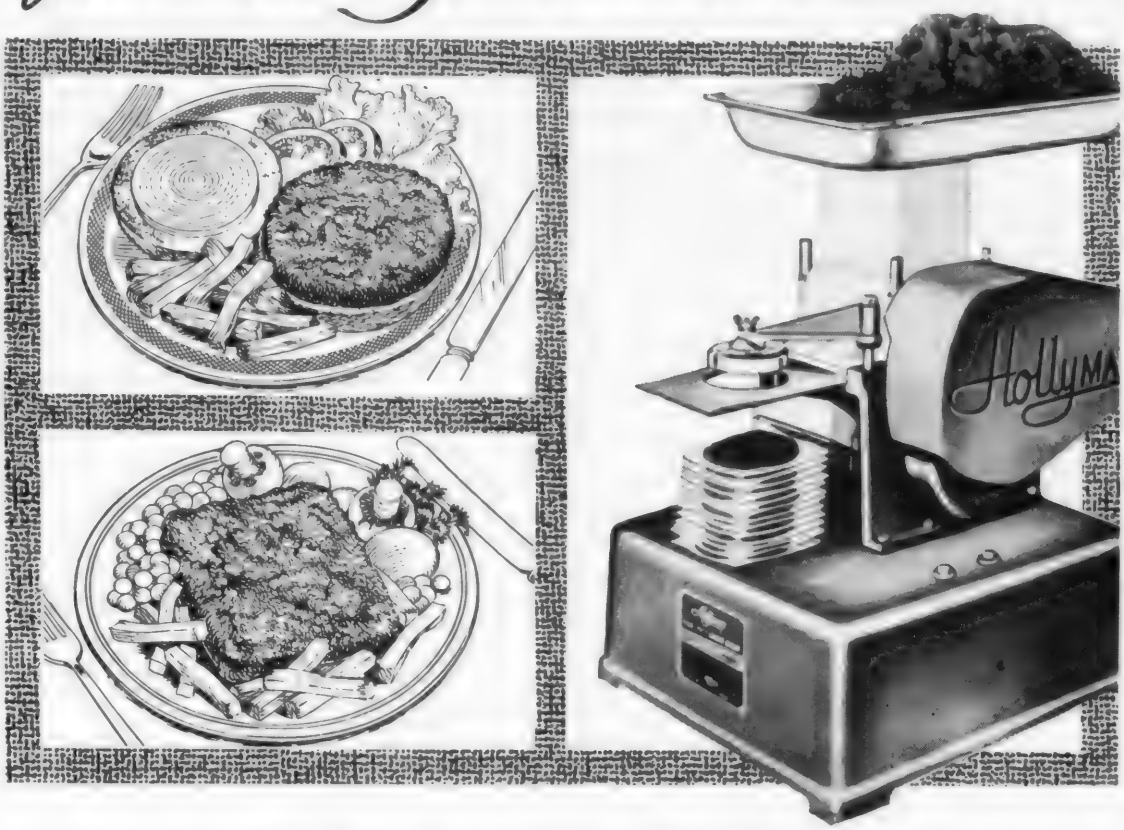

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The versatile Hollymatic Patty Making Machine cuts down overhead costs . . . fast ! It will produce *up to* 1,600 *patties or hamburgers an hour ; identical size ; identical thickness ; identical shape ; and stack them automatically on paper.* The Hollymatic is even more efficient than a trained team of assistants and it requires only a minimum of supervision for a maximum output. Hollymatic makes meat products more saleable, more customer appealing. Write or 'phone us for a demonstration.

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4) Trim and smart, it's a first-rate advertisement for its operator
5) Truly economical, both in running cost and in maintenance
6) Drivers like it – it's comfortable; many calls without fatigue
7) Driver can enter or leave either side
8) Easy to manoeuvre in busy streets, turns in 34 feet
9) It's sturdy – ribbed roof panel . . .
10) and double skin body construction up to waist height
11) Whole body dipped to waist level in 'sealer' before priming
12) Semi-forward control position gives maximum visibility
13) Extra-wide windscreen, narrow side pillars
14) All-synchromesh gearbox – smooth and silent changes
15) Two models available: 90″ or 102″ wheelbase (1 ft. extra length)
16) Capacity: 144 cu. ft. for the 90″; 171 cu. ft. for 102″
17) Two ratings to each length: 10/12 cwt. or 15 cwt.
18) Full-width double-skin rear doors, self-aligning hinges
19) Laminated resin-bonded wood floor
20) Extra-comfortable box-spring seating, latex foam overlay
21) Safety catch holds doors securely open in any of three positions
22) Light, responsive, re-circulating ball type steering
23) Big-bore, short-stroke engine – high power at low piston speeds
24) Adaptable to innumerable body-styles for different trades and purposes
25) Backed by nation-wide economical Bedford service

. . . and that's not all!

Lowest-priced light vans in their class!

The 10/12 cwt. 90″ wheelbase van costs **£445** *(including spare wheel and tyre). £7 extra for 15 cwt. version; £25 extra for longer 102″ w.b. van.*

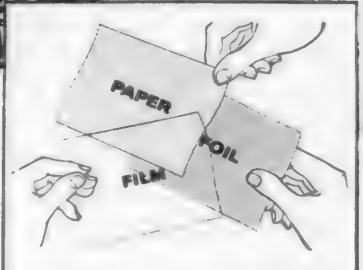
Talk to your Bedford dealer. He will gladly demonstrate the Bedford light van for you, show you even more advantages than are listed here.

Vauxhall Motors Limited · Luton · Bedfordshire

Metal Box tested laminations protect and sell these products

New packaging materials are increasing the scope of laminations: at the Metal Box research laboratories investigations are made to ascertain their suitability—the compatibility with the product, safe shelf life under a wide range of conditions, capabilities on high-speed forming and filling equipment—these points can be assured for your product by Metal Box before a final decision to use a lamination is made.

If you have in mind a free sampling campaign, market trials, nation-wide or even world-wide scheme for unit packs let Metal Box prepare a lamination which will *maintain the quality of your product.*



Light, compact and beautifully printed, laminations can combine the strength and rigidity of paper with the toughness and heat sealability of plastic film and foil. Many different material combinations are available in the form of reels or pockets which can be filled and sealed on high speed equipment.

Consult Metal Box Plastics Group—early

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- The United Glass Packaging Advisory Bureau to give you expert help.
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Glass makes the finest containers of all—and United Glass makes them by the million. Come and see how we can help you.

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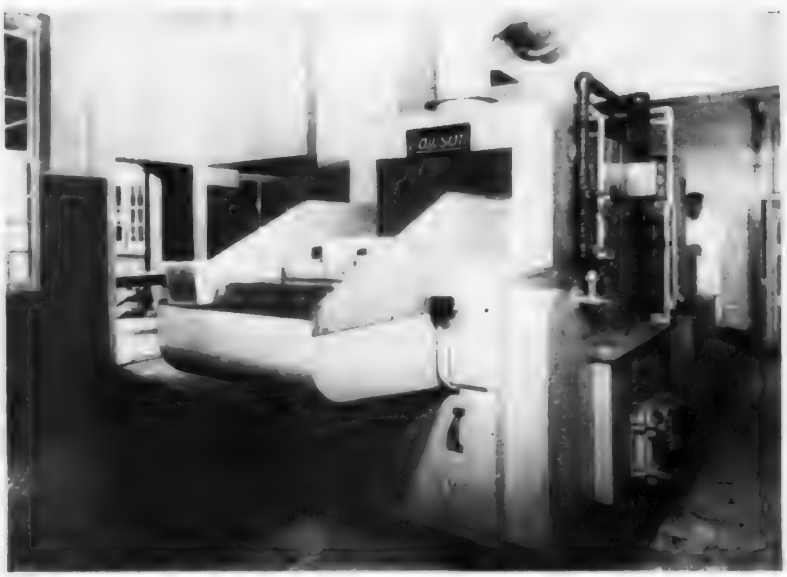
All these trays and utensils are washed and sterilised by this Dawson machine

The picture above will give you an idea of the vast range of items washed and sterilised by this Dawson Machine. The Middlewood Hospital, Sheffield, where it is installed has its own bakery which caters for 2,700 patients, and as well as handling all the trays and utensils used in that section, the machine cleans and sterilises all the food preparation utensils and cooking vessels in use in the large kitchen. In addition, it is used to wash crockery from the staff mess room.

This is just another example of the versatility of Dawson equipment which can mean a considerable saving in money, time and trouble. So pass us your problem and benefit from our many years of experience with washing equipment of all kinds.



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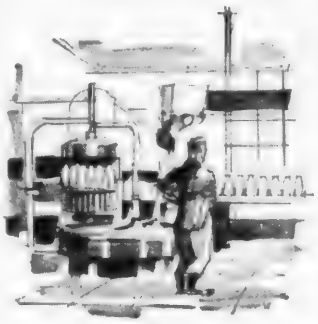
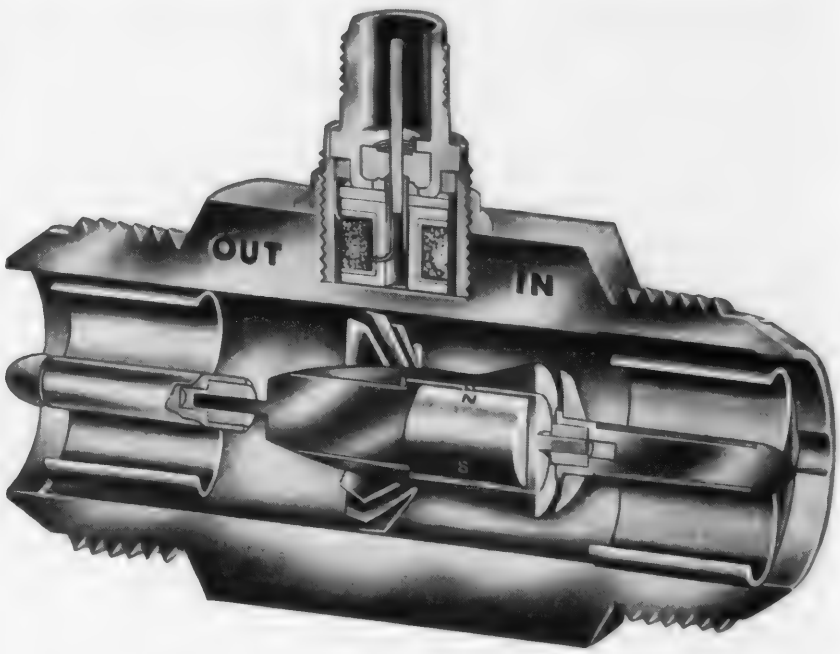
Wherever information on fluid flow is required,

the de Havilland POTTERMETER

sets new standards of accuracy and reliability





This new turbine-type flowmeter enables major advances to be made in the techniques of flow measurement and control. The de Havilland Pottermeter is the only flowmeter which offers all these features:

Manufactured as standard in stainless steel—special sanitary model contains no glands or crevices where bacteria can collect—designed to be cleaned in place.

Accuracy to ± 0·1% or better on repetition work, ± 0·5% or better over a 20·1 range. Calibration remains constant for a variety of liquids over wide flow ranges.

Contains only one moving part—no thrust bearings—demands a minimum of maintenance.

No larger than the pipeline in which it is installed—may be mounted in any attitude.

Can be supplied with indicating, recording and process control equipment— gives digital presentation of results.

Can measure volumetric or mass flows.

Models available to measure flows from 0·1 to 40.000 Imperial gallons per minute, at a wide range of operating pressures. Larger and smaller sizes made to order.

Can measure flow of any liquid or gas, irrespective of its lubricating or non-lubricating properties.

The de Havilland Pottermeter will be demonstrated on
STAND Q.730
at the
I.E.A. EXHIBITION
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May 23 to 28

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Maltsters for more than a Century

'TOPANOL' BHT — a new food antioxidant

The *Antioxidant in Food Regulations, 1958*, permit the use of butylated hydroxytoluene in a variety of foods: 'Topanol' BHT is prepared with great care specially for this purpose.

'Topanol' BHT conforms with the requirements of the *Food Hygiene Regulations, 1955*, and other relevant legislation under the *Food and Drugs Act, 1955*.

'Topanol' BHT meets the following specification:—

Crystallising point	—	*not less than* 69.4°C.
Lead	—	*not more than* 10 p.p.m.
Arsenic	—	*not more than* 2 p.p.m.

Animal and vegetable oils and fats, and baked and fried foods containing these, are protected from rancidity at concentrations as low as 0.01% by weight—cooking temperatures do not destroy activity.

Paper and paper board wrapping impregnated with 'Topanol' BHT at low concentrations keep foods fresher by retarding rancidity at packaged food surfaces and on migrated films of fat.

The appetising appearance of food packs can be maintained by the use of plastic film wrappings (e.g. polythene) colour-stabilised and protected against embrittlement.

Natural and synthetic oil-soluble vitamins (e.g. in fish liver oils) and citrus and other essential oils are also the better for 'Topanol' BHT.

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CRANFORD
½lb. size:
4½" x 3⅛" x 4"
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This year the increased sales and goodwill that result from decorated stock boxes will actually cost you less! The new Metal Box range includes containers suitable for almost all bakery and confectionery products, as well as tea, coffee etc. A wide choice of sizes, shapes and superbly colour printed designs is available.

Order early to avoid disappointment!

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You can order as few as 10 dozen in a single design or size of Metal Box stock boxes or, of course, any larger quantity you like. Long production runs mean very reasonable prices too. Stock boxes are proven sales makers in normal distribution and can also be used for carrying out special trial schemes. Send today for full list and prices.

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7⅛" x 3½" x 2⅛"

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Processed Food Cans · Metal Containers · Paper Products · Plastic Packages and Laminations

MB21/60

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HUNDREDS
OF CONTAINERS

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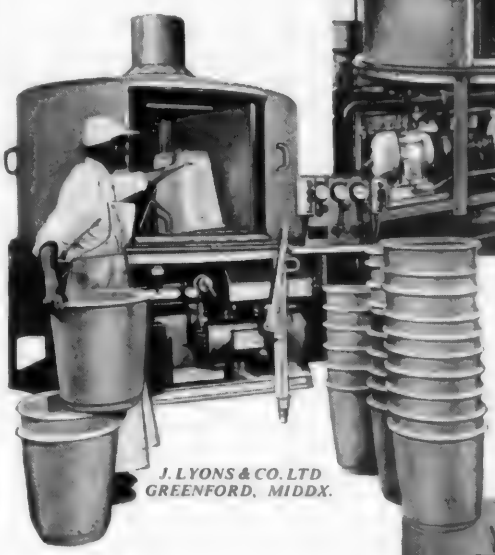
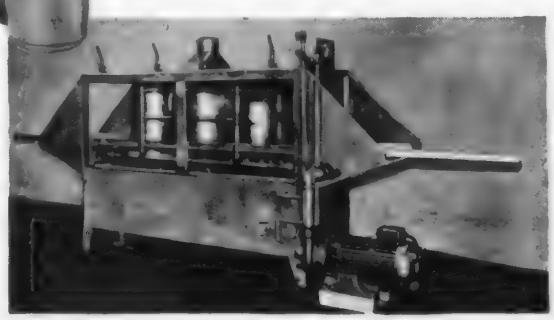
(SALTASH) LTD

MUNTON & FISON LTD
STOWMARKET



J. LYONS & CO. LTD
GREENFORD, MIDDX.

washed by W.H.
...in double-quick time



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W. H. washing equipment handles containers with amazing speed and thoroughness. Out they come, clean as whistles, completely ready for further service.

W. H. have solved can, churn and container washing problems in many industries, and their wealth of experience is freely at your disposal. If you have a container-washing problem, Wright Hargreaves can supply the answer—either as a standard machine, or as equipment specially tailored to meet your individual requirements.

Hand-fed and Automatic rotary equipment for washing/sterilizing containers at a rate of up to 360 per hour.

Straight-through systems —fully automatic—for washing/sterilizing up to 720 containers of varying sizes per hour. Automatic removal, washing and replacement of lids can be incorporated. Power conveyors with 'Patent' non-friction bends are available to help further speed the operation.

Whatever your problem, we'll be happy to study it and make recommendations.

Wright Hargreaves are the sole agents in England, Scotland and Wales for Silkeborg Plate Heat Exchangers that meet the highest standards of the food industry.

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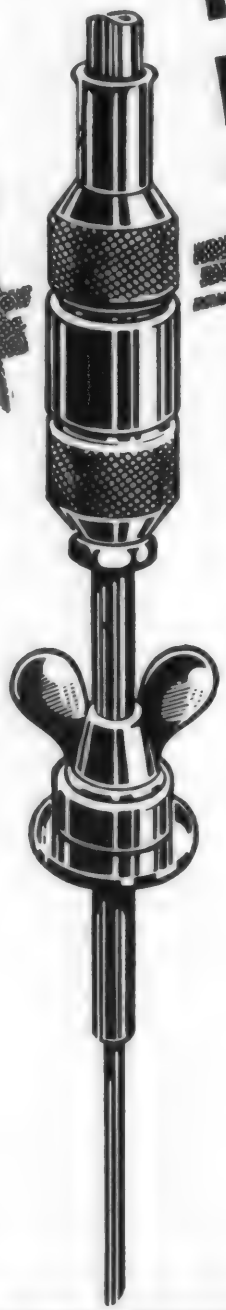
Smees W.H.5

HEAT PENETRATION

of canned foods in an autoclave



These special thermocouples developed for use in the food and kindred processing industries are widely used because of their accuracy, interchangeability, rapid response and robustness, and can therefore be relied upon to give long and trouble-free service.

These thermocouples may be used with a variety of temperature indicating and/or recording instruments, three examples of which are illustrated on the right. These are (a) Portable Indicator with 7″ long mirrored scale, (b) Electronic Self-Balancing Indicator/Recorder giving continuous record on disc type chart and (c) a Teloscale Indicator which indicates the temperature of the thermocouple on a translucent scale having an effective length of over 50 inches, thus permitting temperature readings to be accurately observed from a considerable distance.

(A)

(B)

(C)

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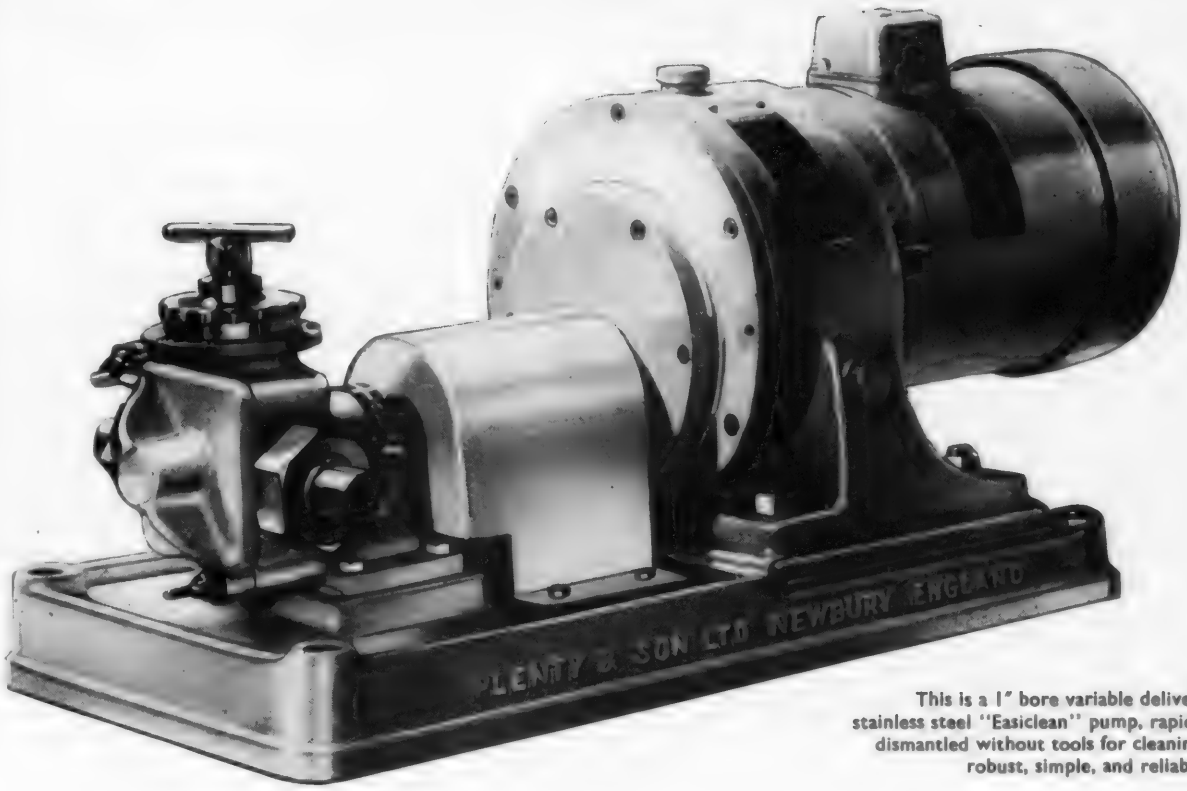

This is a 1" bore variable delivery stainless steel "Easiclean" pump, rapidly dismantled without tools for cleaning: robust, simple, and reliable.

Variable Flow Easiclean Pumps

Now manufactured in all sizes up to 3" bore, from 0 to 30 g.p.h. up to 0 to 7,500 g.p.h., this is the IDEAL PUMP for METERING AND BLENDING in the FOOD AND PHARMACEUTICAL INDUSTRIES.

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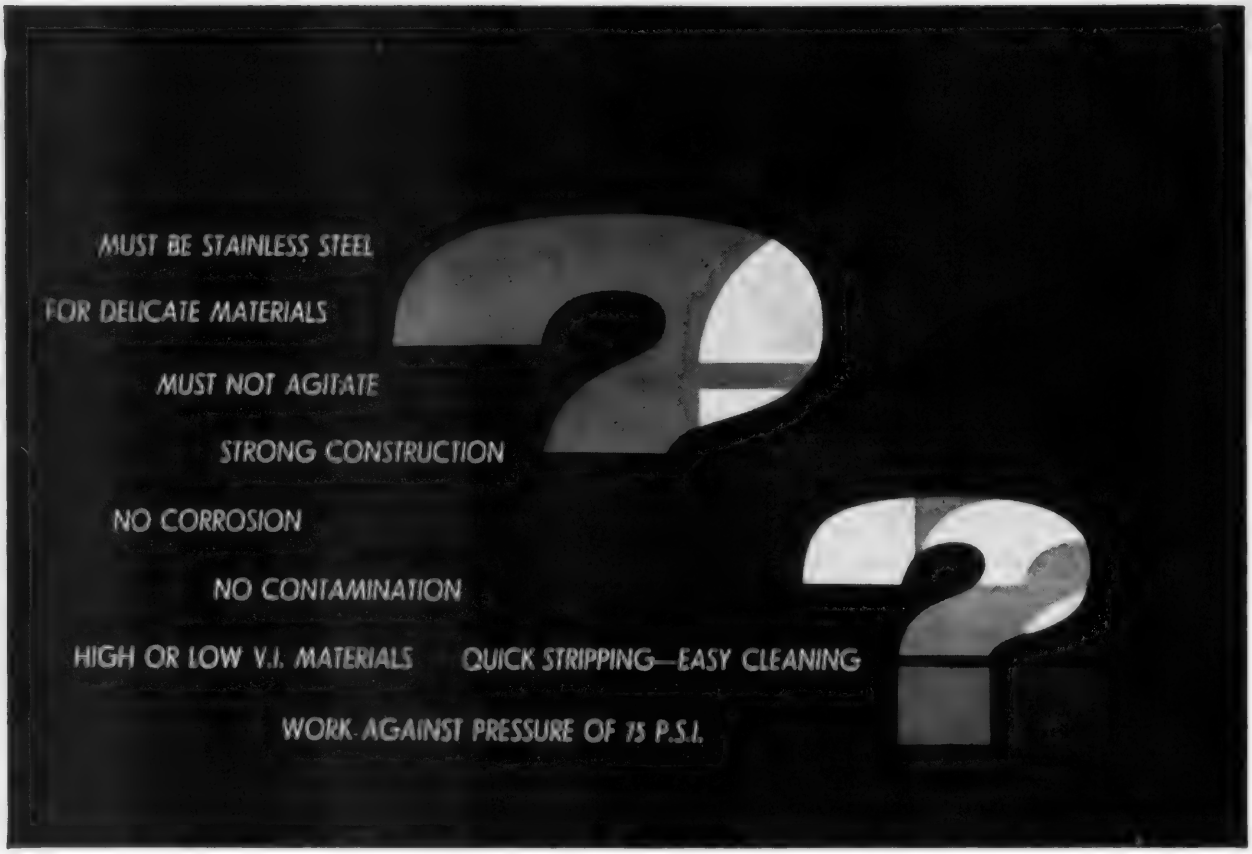
Eagle Iron Works, PLENTY & SON Ltd. **Newbury, Berks., ENGLAND.**

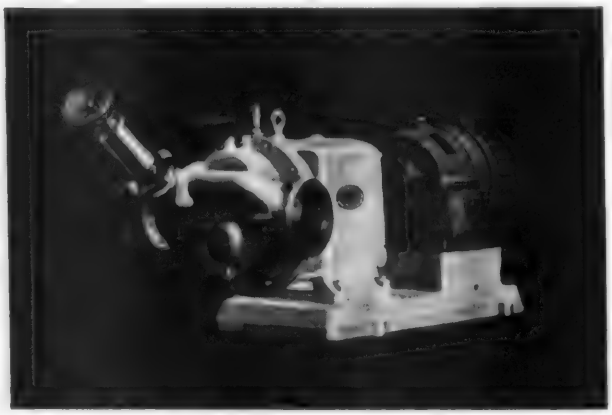
F.M. Telephone: Newbury 2363 (5 lines) Telegrams: Plenty, Newbury Telex: 84110



IS THIS YOUR PROBLEM?

THE HOWARD 'M' TYPE All Stainless Steel Positive Rotary Pump is a robustly constructed piece of machinery especially designed to solve difficult pumping problems. It handles delicate materials—even those with a high V.I.—without any agitation or contamination. The pump can, when necessary, be jacketed for heating, or cooling.

NO CORROSION OR CONTAMINATION: Constructed throughout in stainless steel all bearings are external to the pump chamber to avoid contamination of the material being pumped.



V.I. VERSATILITY: The 'M' Type will handle high or low V.I. materials with equal ease and efficiency. For high V.I. materials the specially designed rotors and the large suction and discharge passages assure an easy, streamlined flow.

EASY MAINTENANCE: Cleaning the 'M' Type is a quick and easy process. For cleaning, the Rotor Case and Rotors are removed from the body of the pump. Stripping and reassembly are made much easier by the use of special type wing nuts which hold complete Rotor Case and Pumping Head in position.

MANY USES: The 'M' Type Rotary Pump is exceptionally versatile. It is available in seven sizes, giving from 15 to 15,000 g.p.h. for heads up to 200 ft. It has found wide and varied use throughout the food and chemical industries.

if so—the answer is a

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ALSO MANUFACTURERS OF HOWARD TRIPLEX, CENTRIFUGAL AND PROPORTIOMETER PUMPS

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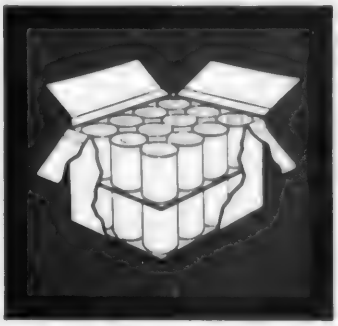

Your goods have arrived. And thanks to "Fiberite" Cases they have arrived factory fresh. Whether in city supermarket or village store, this is the end of the line. Now your goods see the light—on the shelves, in the window.

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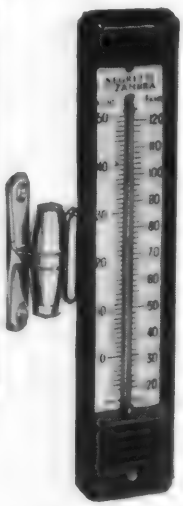

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4" Mercury-in-steel
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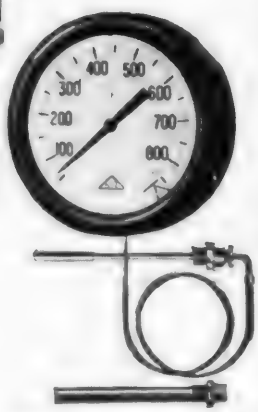
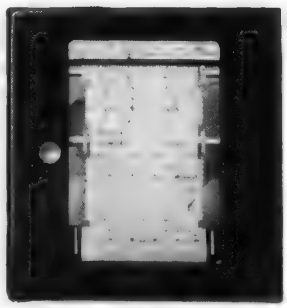
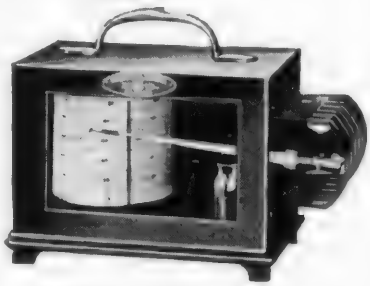


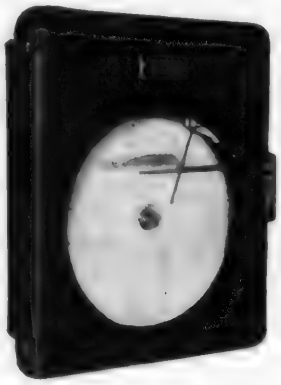
Distance-type Mercury-in-
steel Dial Thermometer



Resistance Thermometer
Recorder



Bi-metallic Recording
Thermometer



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I have pleasure in sending you herewith a photograph which was taken approximately 8 months after application of the paints.

The Dentolite which you have sold us is in the centre panel of the photograph. It is evident that this has behaved perfectly in comparison with the two competitive products on its left and its right, particularly as the little stains that show in the left hand bottom corner are accidental dirt marks.

Allow me to congratulate you on the quality of your product and I remain,

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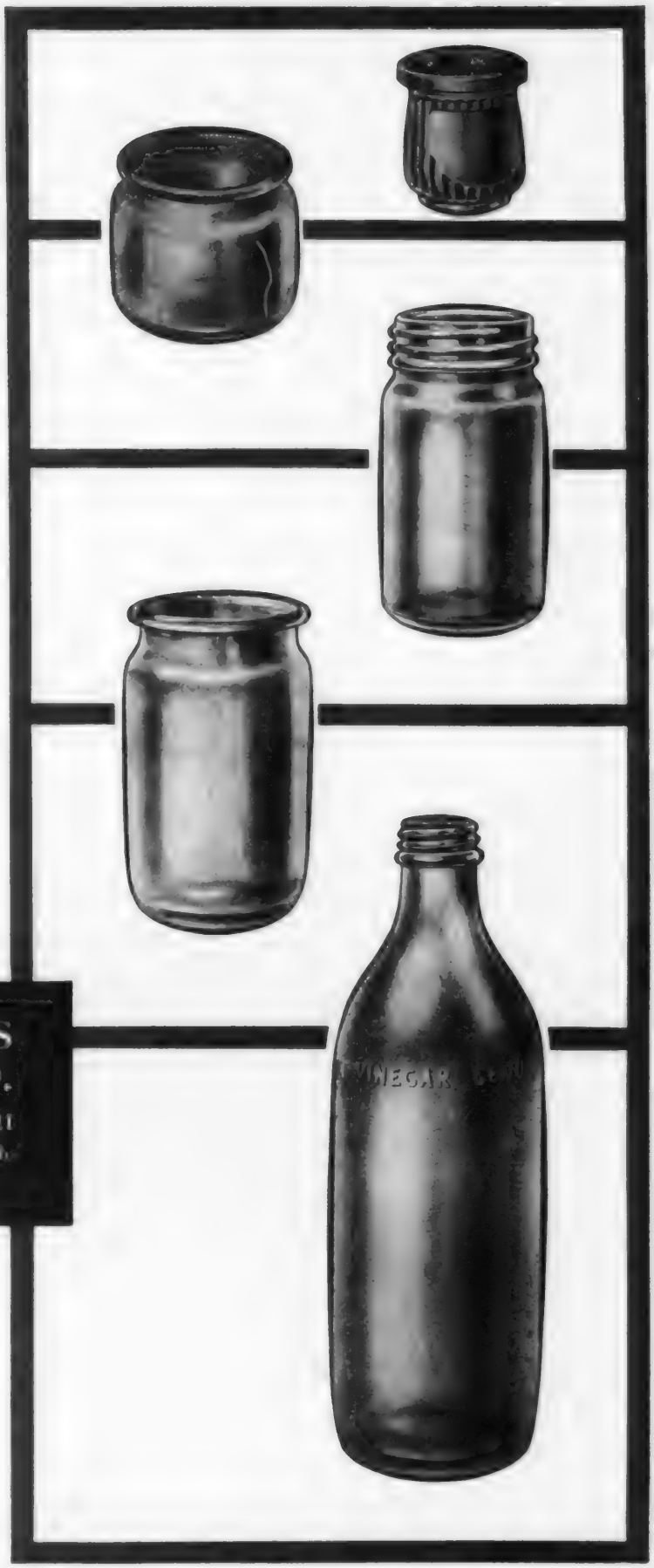

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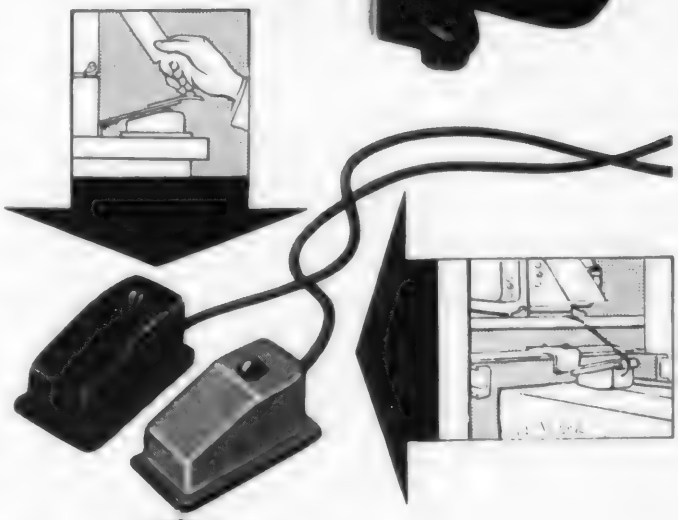

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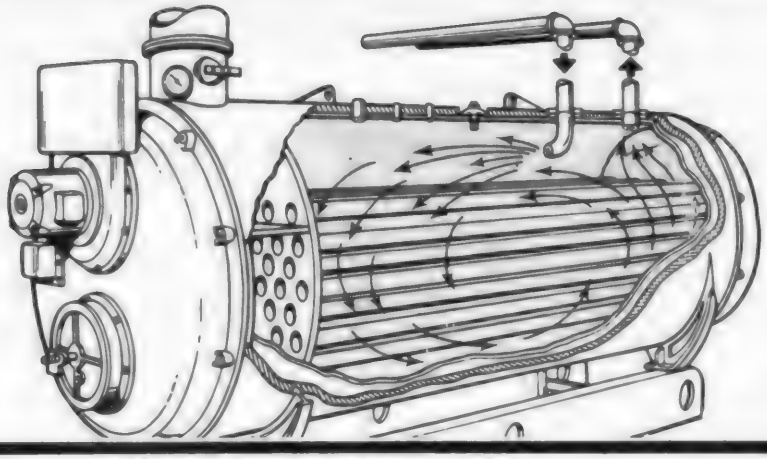

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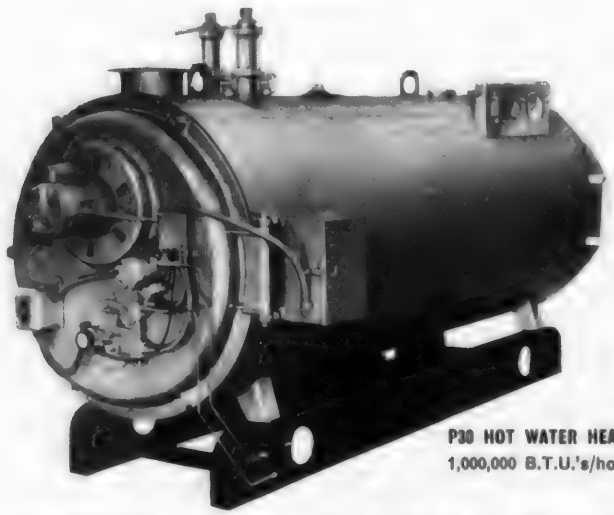

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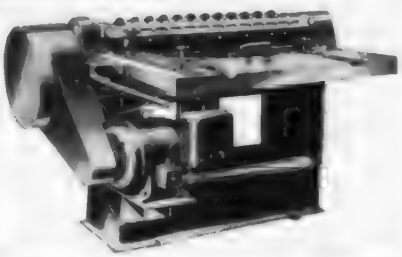
BLISS

225A



325C

The Bliss range of Slitters and Trimmers Nos. 5225, 225A and 325C covers every slitting and trimming operation for can-making, for strip feed presses and for tin printing machines.

The 5225 provides slitting and trimming on a single machine and is the ideal unit for fast production can-making lines. The 225A and 325C combine accurate, dependable slitter production with speed in cutting and simplicity of operation.

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let IMC solve your fi

If you have a filling problem in your plant, whether it be for solid packs with brine, syrup, oil or other liquids, or the more complicated filling of paste or mixed foods, IMC has the answer for you. Here is shown a typical high speed IMC 520 Pea and Bean Filler featuring unsurpassed accuracy of both product and liquid fill. Speeds up to 350 cans per minute are being realized in installations throughout the world.

The insert shows the FMC-IMC 20 Pocket M & S Piston Filler for viscous products. It is capable of speeds up to 600 cans per minute depending on product and can size.

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ELIMINATES WASTE : Automatic No-Can, No-Fill device on both product and liquid sections.

ACCURACY OF FILL : Provides greatest accuracy on widest range of products of any fillers available today. Volume of fill is readily adjustable on all IMC Fillers.

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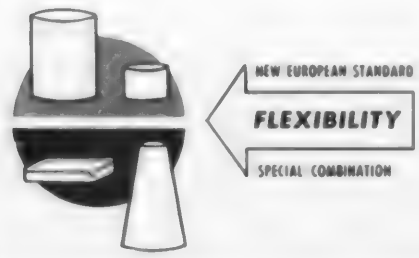
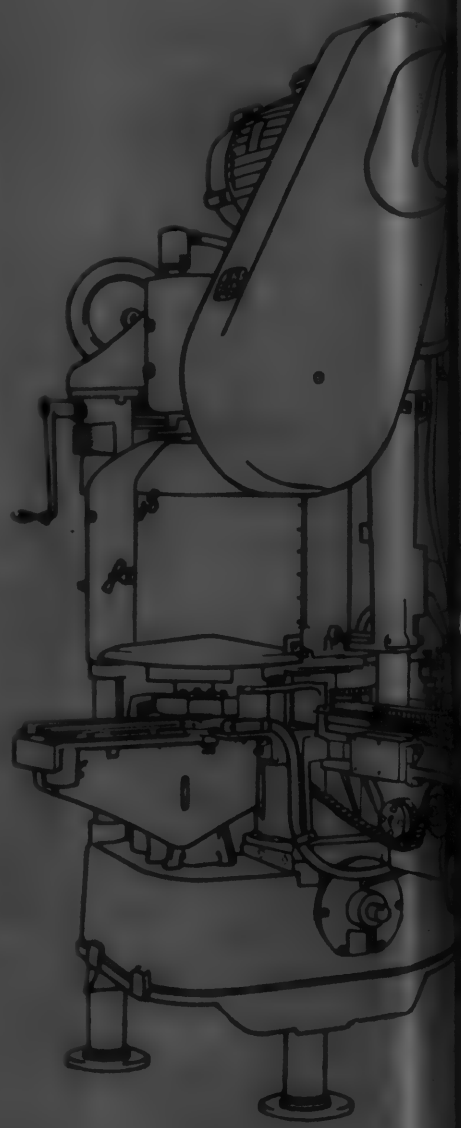
RAPID CHANGE-OVER : Change from one size to another is accomplished quickly and easily within the range of the machine.

IMC-FMC equipment is the most widely used food processing equipment in the world. It is now built in Europe and readily available to meet your specific needs.





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PALMER

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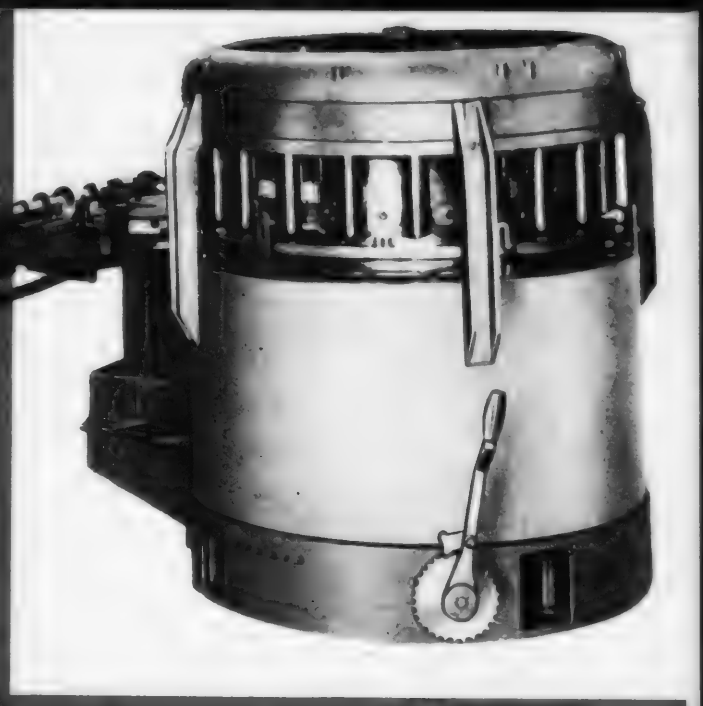

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help in solving your
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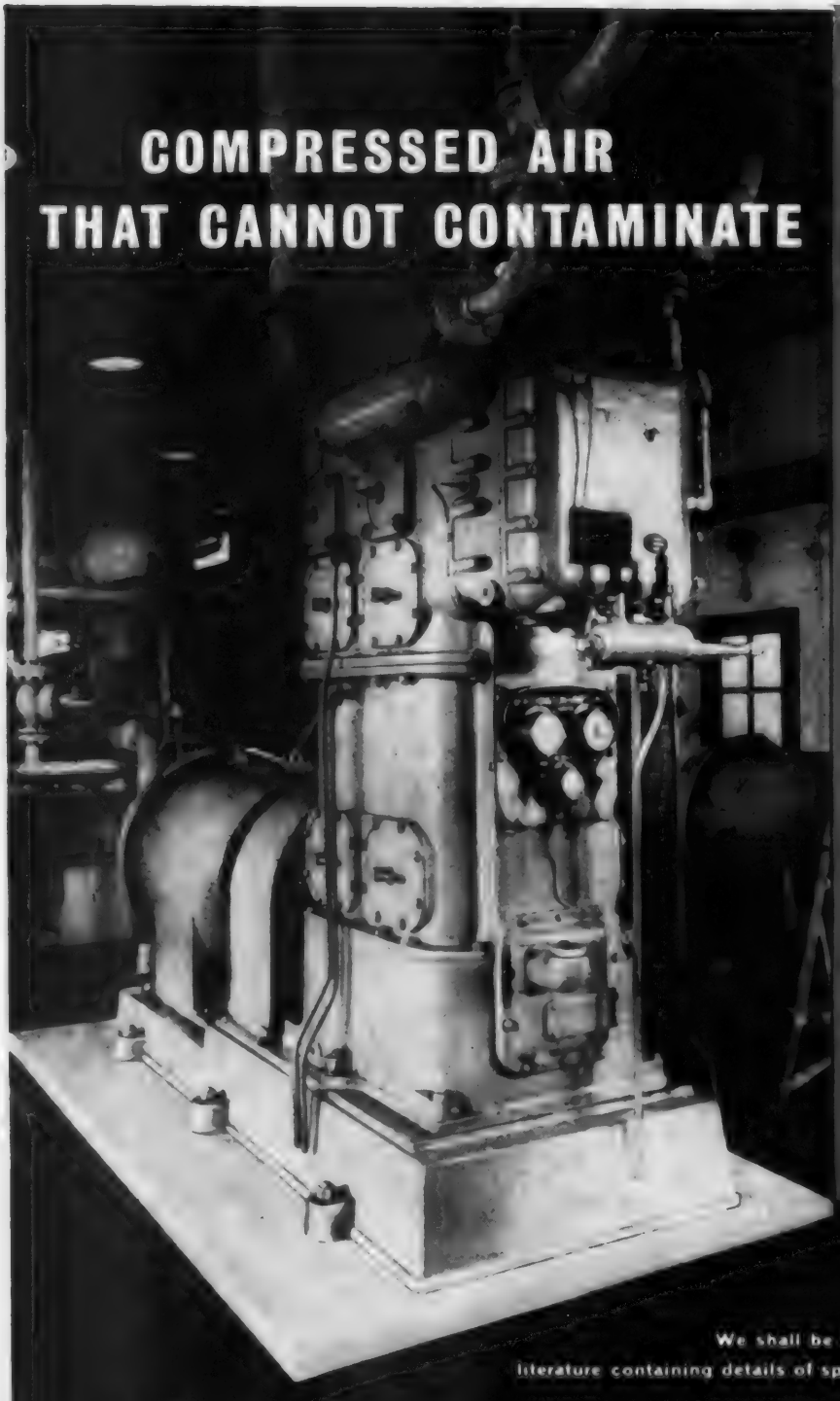

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The compression chamber is designed to operate without lubrication, thus ensuring complete freedom from oil contamination.

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We shall be pleased to send you technical literature containing details of specifications and performances.

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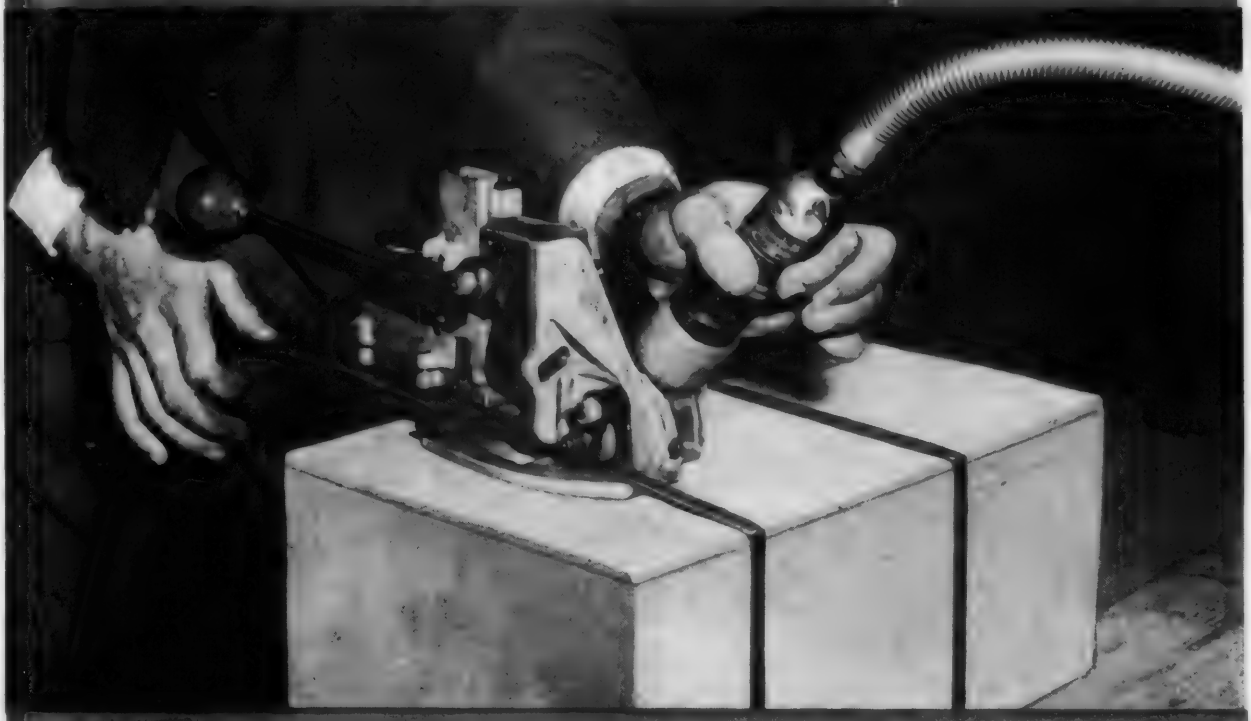

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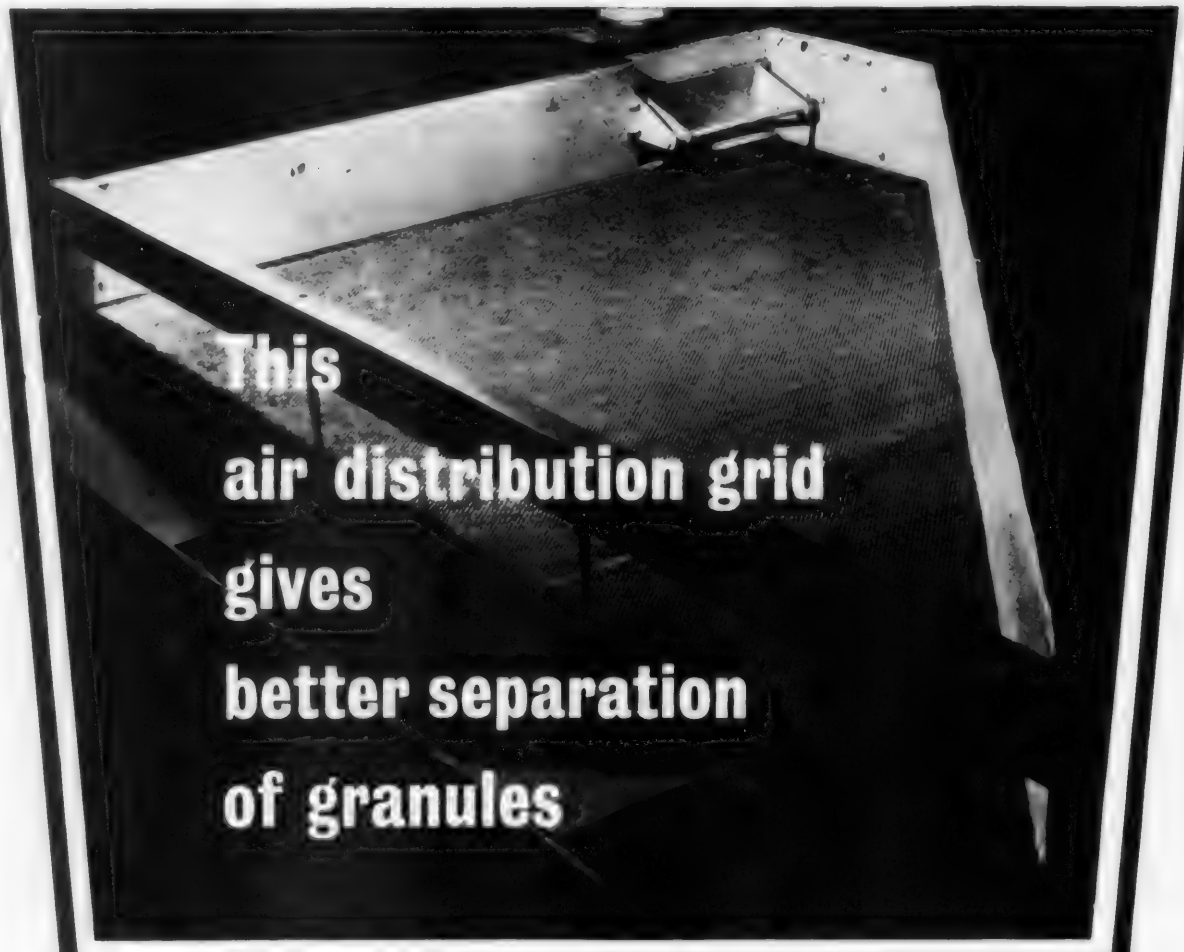

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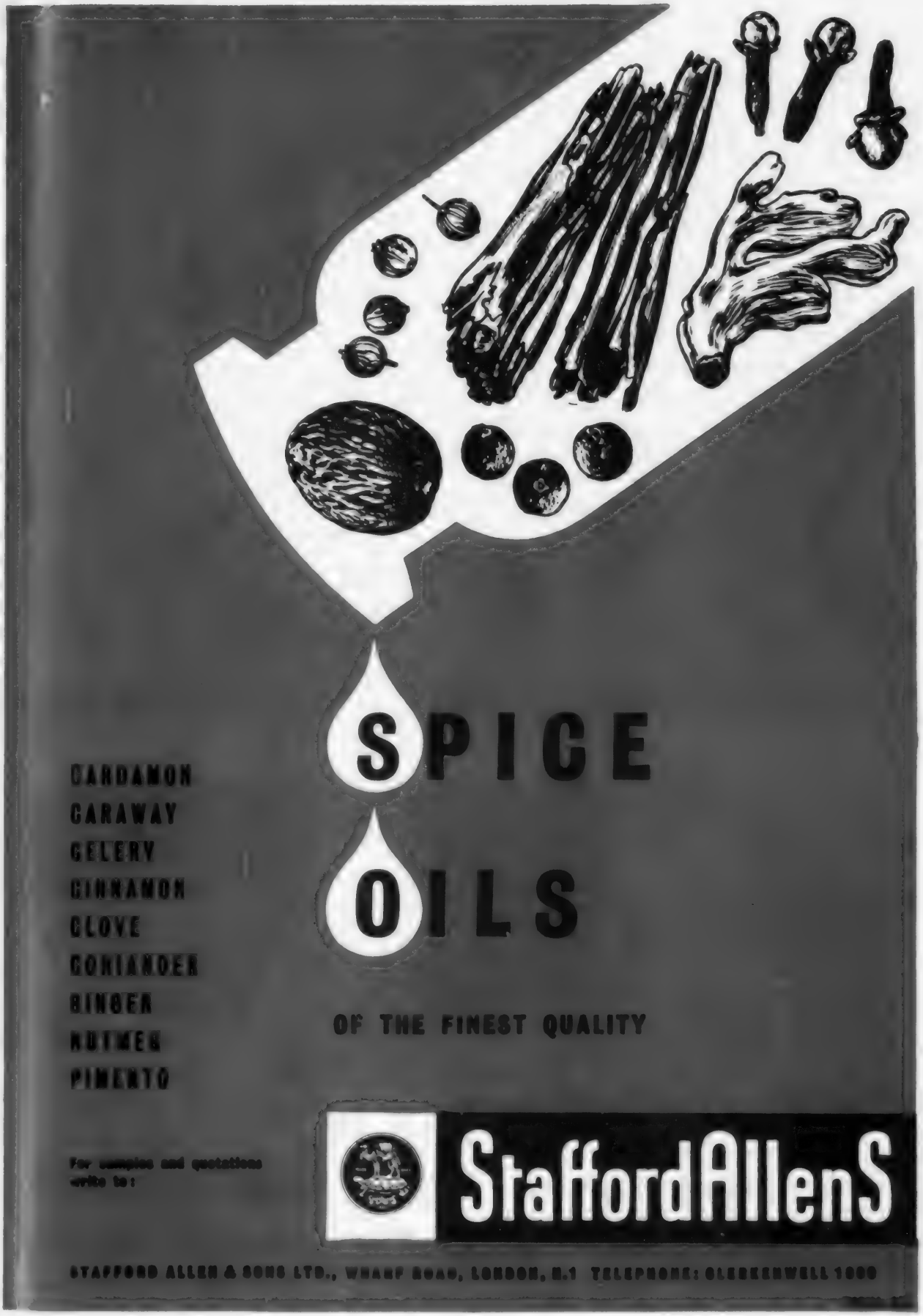
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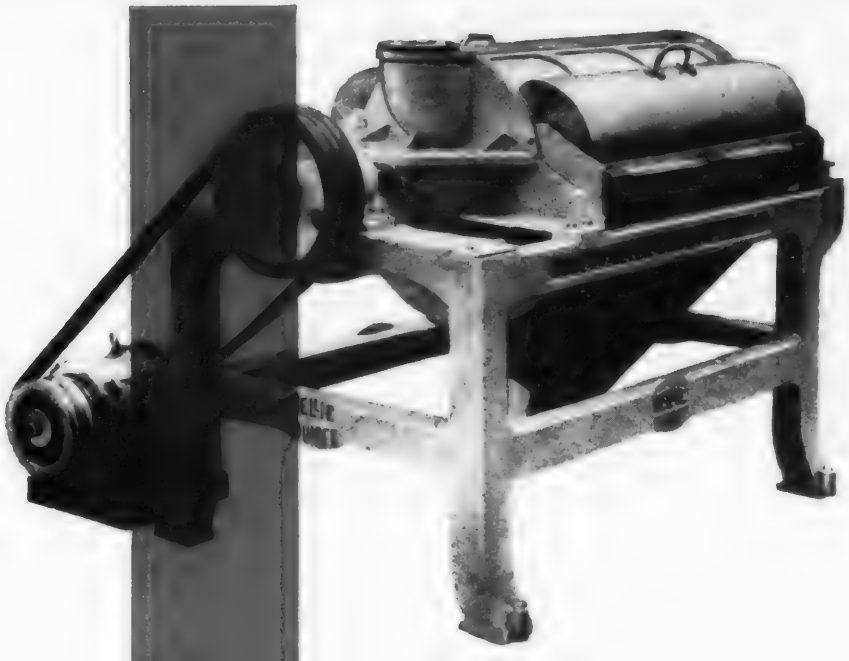

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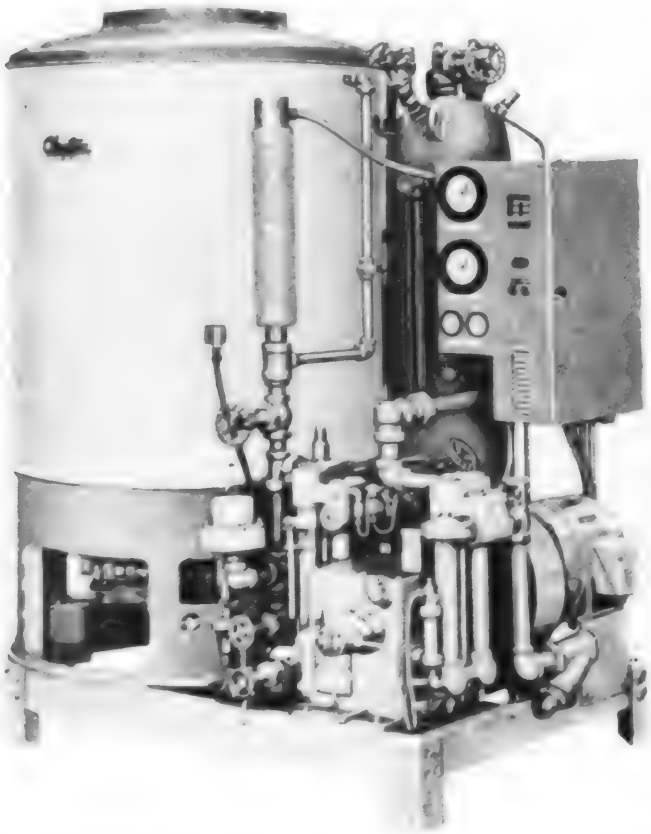

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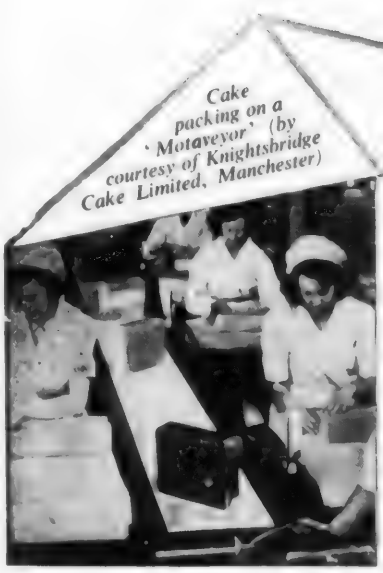
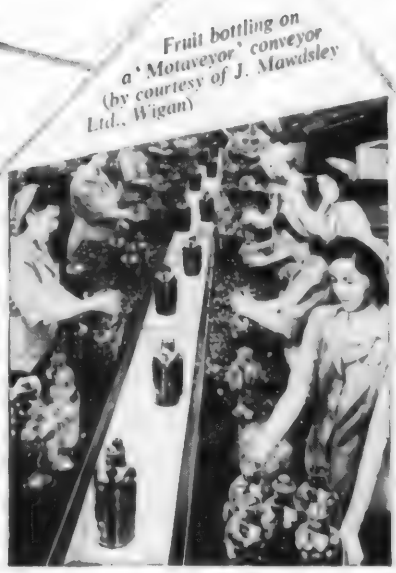
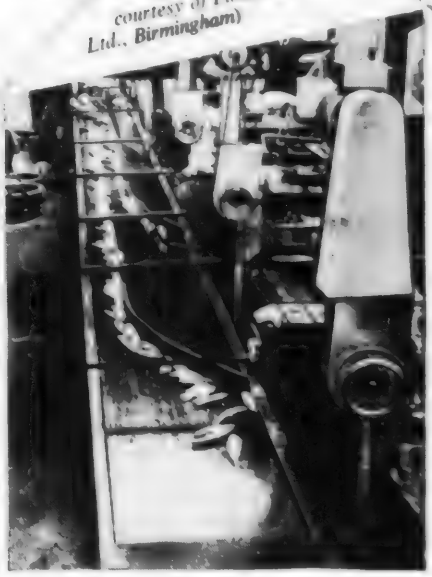


Cake packing on a 'Motaveyor' (by courtesy of Knightsbridge Cake Limited, Manchester)



Fruit bottling on a 'Motaveyor' conveyor (by courtesy of J. Mawdsley Ltd., Wigan)



Scandura conveyor in a fish canning factory (by courtesy of Fisher & Ludlow Ltd., Birmingham)

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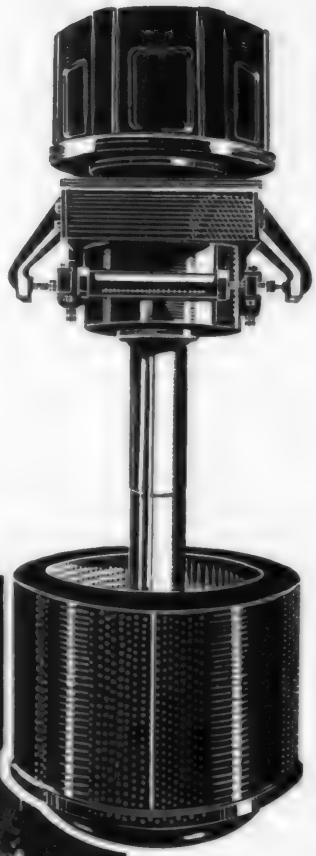

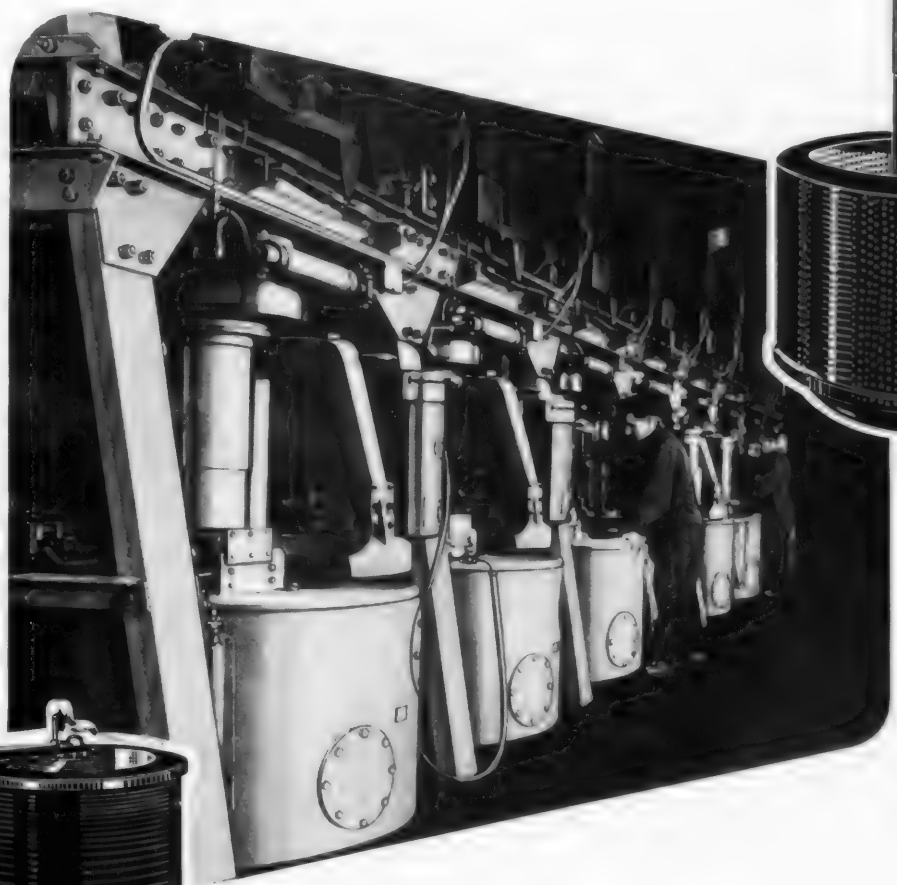

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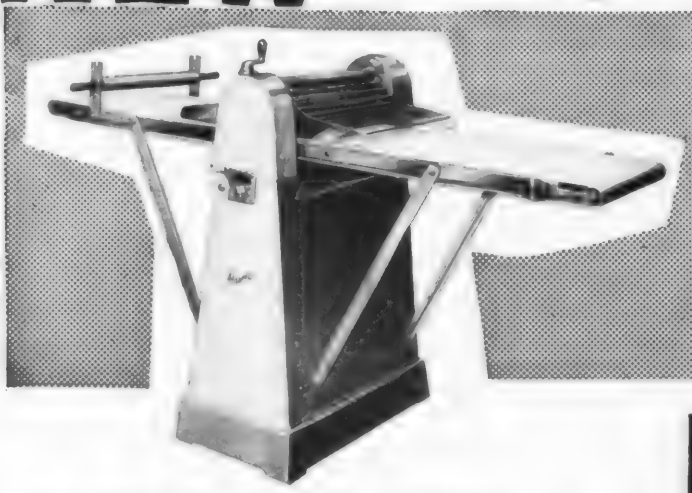

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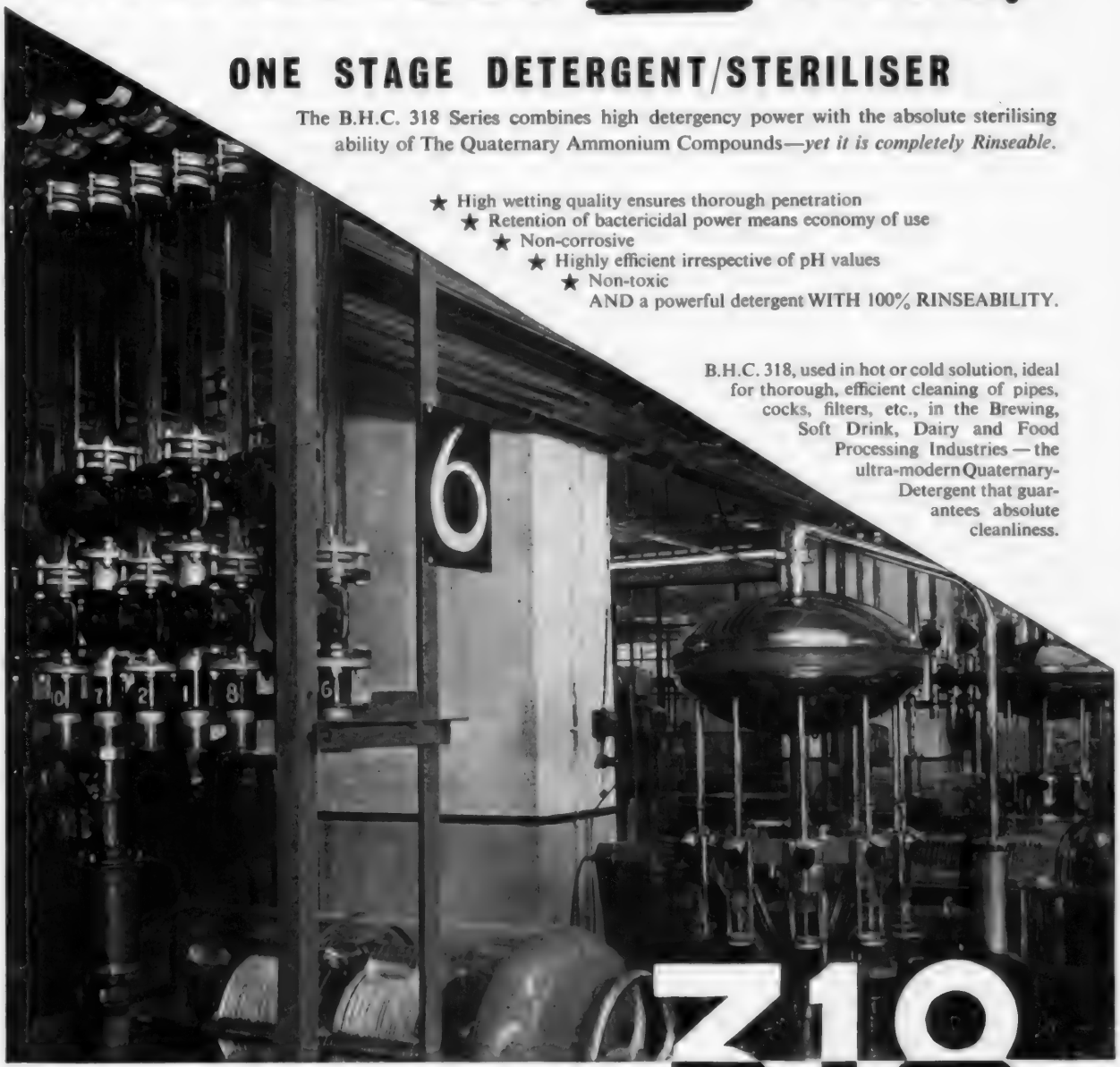

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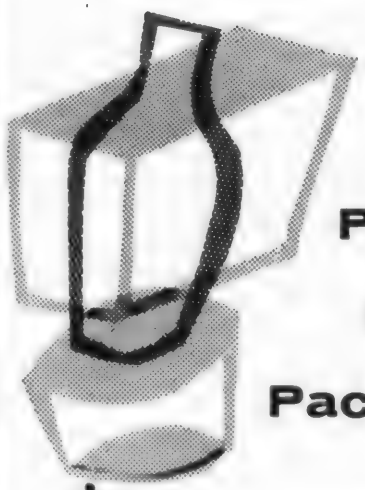

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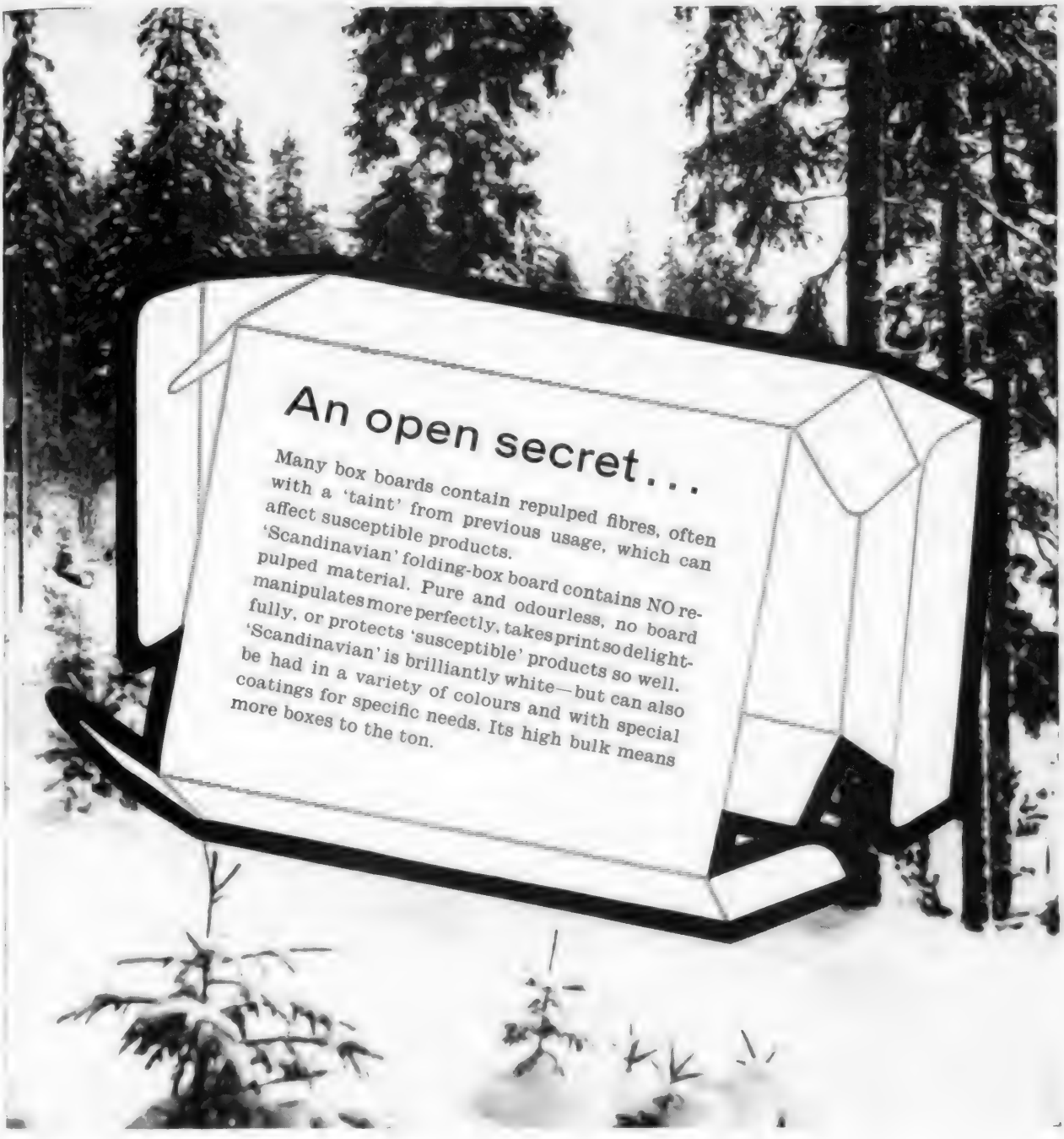
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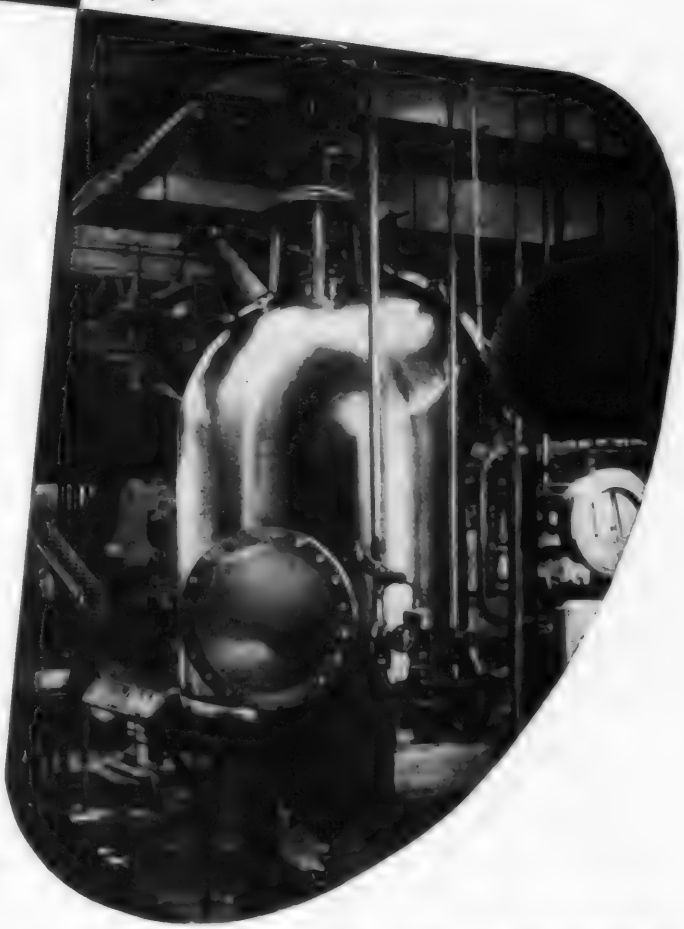

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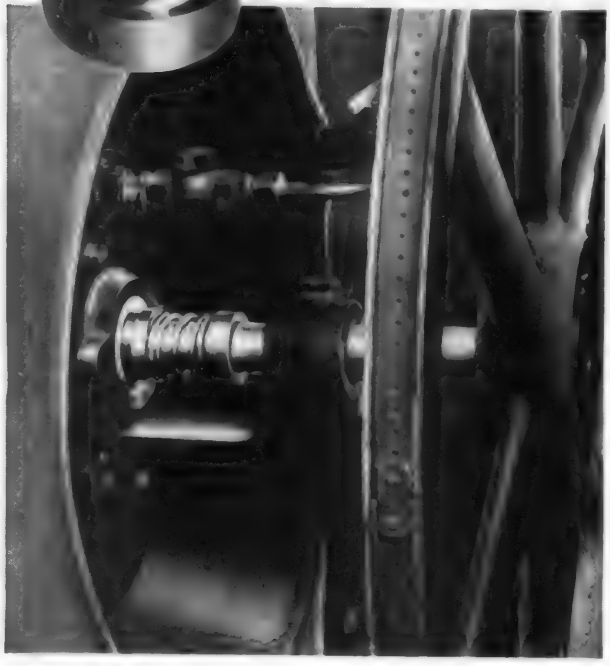

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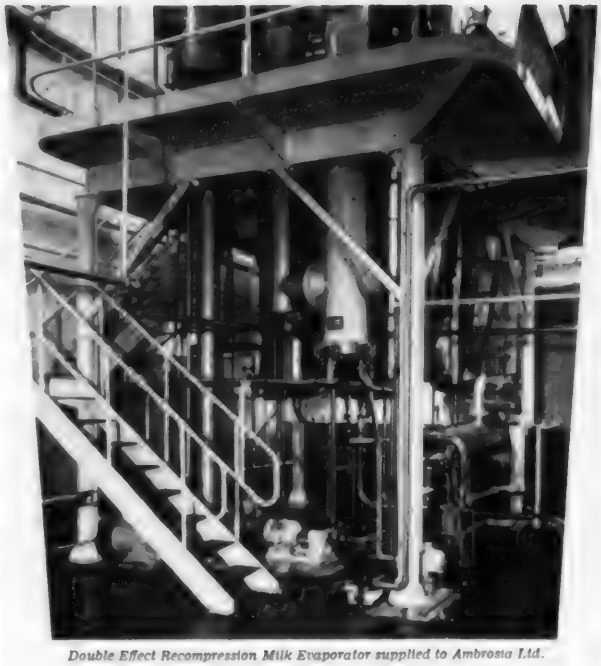

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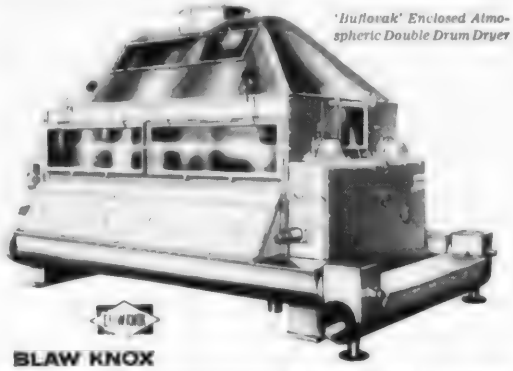

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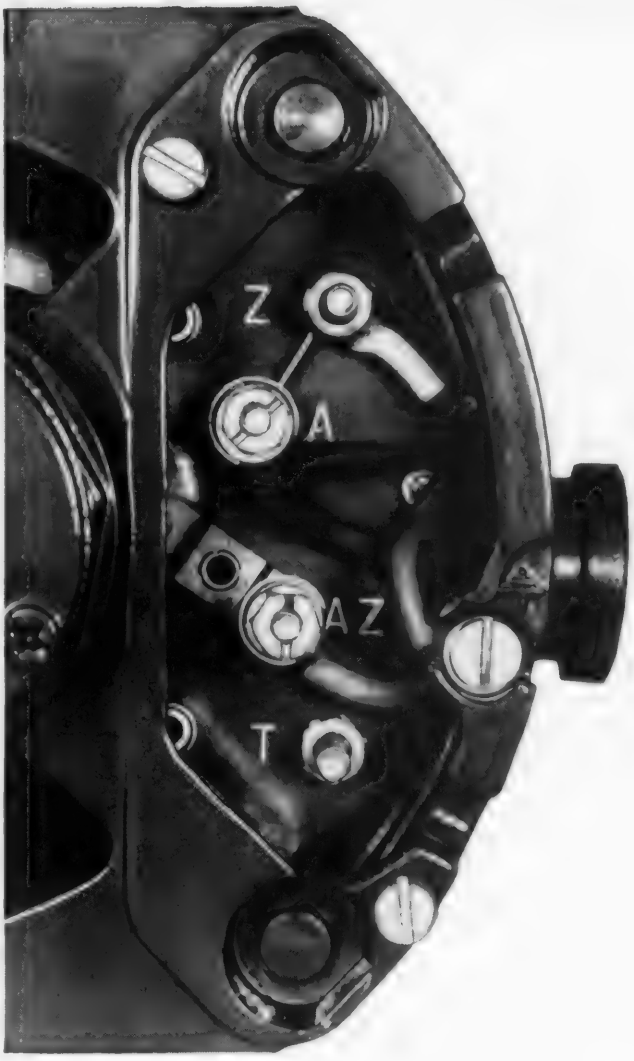

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Something important has been obscured by the success of the mathematical approach to design – that engineering is an art as well as a science. Not everything can be worked out: beyond a certain point – particularly on detail – the designer has to trust his eye, his feeling for a sound job or his imagination. But these, in turn, depend on experience, not his alone; the common stock of the people he works with. This is the art; and it is the channel through which the accumulated experience of an engineering firm is fed back into new products.

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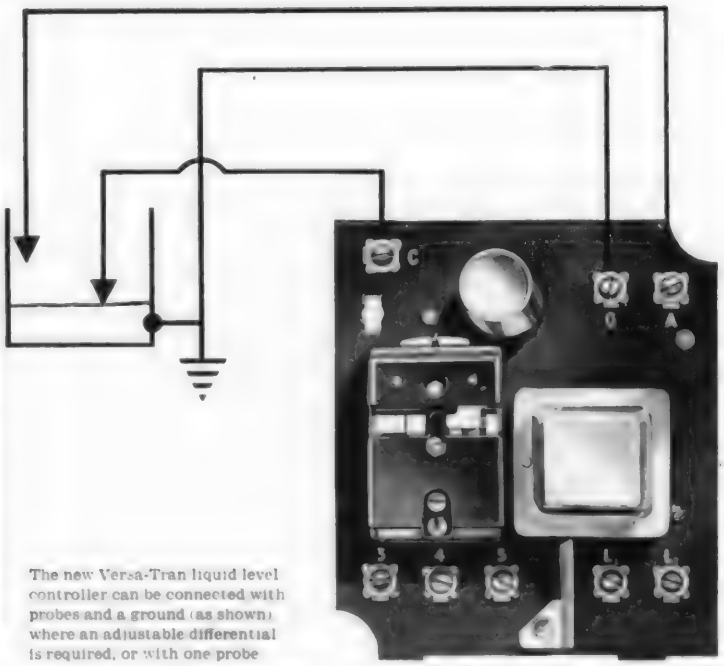

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FOOD MANUFACTURE

Volume XXXV. Number 5 Editor: Anthony Woollen, B.Sc., A.R.C.S., A.R.I.C. May 1, 1960

Editorial	177	Scotland's Newest Bakery Opened	209
How Latham Foods make Cornflakes and Cake Mixes	181	Italian Cheeses are gaining popularity	210
Mechanical Handling: Exhibition Review	186	Packaging	211
Annual Review: Meat. *By F. J. Mallion, M.R.S.H., M.Inst.M.*	197	Advances in Food Technology	212
World Food Supplies—4: Standards of Nutrition—I. *By Francis Aylward, Ph.D., D.Sc., F.R.I.C.*	203	Machinery and Equipment	214
Pear Canning in Britain can pay off. *By L. B. Scott.*	207	News Digest	216
		Food News Overseas	222
		Recent Patents	224
		Trade Marks	224
		New Companies	224

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The following series of notes will give details of the specialised products manufactured by Loders & Nucoline Ltd. together with their applications. Copies are available, together with a folder, on request to Loders & Nucoline Ltd., Unilever House, London, E.C. 4

COBERINE

Description

Coberine is identical in all its physical properties with Cocoa Butter, but has not its characteristic flavour. It is completely odourless and tasteless and is fully compatible with Cocoa Butter. It is of entirely vegetable origin and is prepared especially for the chocolate industry.

Uses

Coberine is used to replace Cocoa Butter in high class chocolate work. It can be used up to 70% of the total fat content to replace Cocoa Butter, but because of flavour considerations it is normally used in smaller proportions. It gives good contraction on cooling and behaves in exactly the same manner as Cocoa Butter in the manufacture of chocolate. The part substitution of Cocoa Butter by Coberine involves no change in manufacturing, tempering and cooling conditions either for block chocolate or covered centres.

Notes

This product can be used to advantage where a less strong flavour is required. It gives no increased tendency to bloom when incorporated in chocolate and extensive keeping tests of manufactured products containing Coberine have given entirely satisfactory results.

TYPICAL PHYSICAL CONSTANTS

I.V.	34
Sap. Value	196-197
Cooling Curve	(Jenson)
Min. Temp.	23.5
Max. „	29.5
Time	60 mins.
Temp. rise	6°C.

VEBERINE

Description

A high grade Illipe Butter which is completely tasteless and odourless. It has characteristics which closely resemble those of Cocoa Butter.

Uses

Normally used as a part replacement of Cocoa Butter where it is desirable to increase the hardness of chocolate. This may be necessary, for instance, where chocolate and similar products are manufactured for export to tropical countries. Veberine can also be used in some types of medicinal sweets.

Notes

Veberine is compatible with Cocoa Butter and has good stability. The chocolate has a good shelf life from the point of view of taste and bloom.

TYPICAL PHYSICAL CONSTANTS

I.V.	31.5
Sap. Value	192
Cooling Curve	(Jenson)
Min. Temp.	26°C.
Max. „	34°C.
Time	55 mins.
Temp. rise	8°C.

LN 64-8058

FOOD MANUFACTURE

Vol. XXXV, No. 5 May 1, 1960

Progress of the testing station

FIRST reactions to the appeal for funds for the proposed biological testing station (see last month's comment) have been encouraging, and some substantial donations have been forthcoming. We go to press before the meeting on April 21, and it would be premature to anticipate any official announcements, but funds in hand are not likely to be greatly different from the initial target figure.

By the time this appears, preliminary discussions with the D.S.I.R. will have been held, and if all goes well, the testing station will be organised on the same lines as an industrial research association. A conflict of views on the question of finance was the principal reason why the original proposals came to nothing. The Food Manufacturers' Federation held the view that the bulk of the funds should come from the additive makers whose products would be put to the test, and that contributions from the food industry itself should be small. It is a tribute to the determination of the resurrected committee, under the chairmanship of Mr. R. P. Woollard, that they have succeeded in overcoming this formidable problem.

In view of the importance of the enterprise, the anonymity under which the preliminary steps have been undertaken is rather strange. Perhaps the committee members felt they were not sufficiently representative, and indeed it is important that the interests of both the food and chemical industries are fully served. Perhaps, too, being an unofficial committee, they did not wish to influence in any way the election of officers under properly constituted rules. Nevertheless, we feel they have been too modest; people like to know who are behind anything, and why should the affiliations of the new association not have been divulged at the beginning?

Other uses for machines and materials

MAKERS of food machinery may well consider, if they have not already done so, the fact that their machines may have applications in fields other than food. Many materials in the plastics, rubber and paint industries, for example, have similar physical properties to certain foodstuffs. We heard recently of a sausage filling machine being used to fill putty into plastic containers, and other possible uses for all manner of food machines will readily spring to mind. The converse is also true, that machines not originally designed for food can be adapted for food use.

Food materials, too, have often diverse uses; starch, for example, has other applications besides confectionery and cake mixes, one of which is as a binder for sand moulds used in foundry work. We need not elaborate on the production of industrial alcohol from potatoes, or the use of casein in plastics manufacture, save to observe that in our opinion, when so many in the world today are hungry, the use of foodstuffs for non-food purposes should be exercised with reserve, and only when waste would otherwise ensue. We believe that ethics come before profit; deliberately to divert food to other uses in order to keep up the price arouses indignation richly deserved.

Sometimes subsidiary yet valuable properties of food materials are dicovered by accident; we learnt from a recent paper presented to the S.C.I. Food Group, that glucose and sucrose inhibit the corrosion of copper by ammonia. This is of some commercial importance, because biscuit cutting machines contain a high proportion of copper, and biscuit doughs usually contain ammonium carbonate or ammonium hydroxide as an ingredient. One would therefore expect corrosion to be quite considerable, but it is not, and the copper alloys are satisfactory materials, because glucose is an excellent inhibitor under static conditions. The reason for this, as discovered by a detailed investigation carried out in the U.S.A., is that glucose reduces cupric ions to cuprous, which remove dissolved oxygen from solution. Copper is not attacked by ammonia in the absence of oxygen.

Sucrose is a weaker inhibitor than glucose, and in this case the mechanism of inhibition is the stabilisation of the cupric valency state by chelation. Other polyhydroxy compounds and sugar alcohols have a similar effect.

On the subject of inhibitors—who does not know that sodium benzoate, ubiquitous preservative, is also a corrosion inhibitor, in radiator anti-freeze for example? *Cui bono!*

Materials handling

"MATERIALS handling does not control, form or change a product in any way. It is wholly a service function, and as such has a direct bearing on costs and profits. Thus it is one function that can be progressively improved and frequently with little outlay.

"*Every time a product is handled, something is added to its cost without increasing its value.*"

This preamble to a recent British Productivity Council conference on materials handling aptly describes in a nutshell the philosophy underlying the whole concept of shifting things from one place to another. The sentence in italics should be graven on the heart of every manufacturer. In some plants little thought is given to wastage caused by inefficient handling. How many man-hours are lost to industry by moving things further or more often than necessary is anybody's guess; a statistical enquiry would probably uncover startling results.

This month the Mechanical Handling Exhibition is being held at Earls Court, London, from the 3rd to the 13th. All the latest ingenious contrivances for moving about an infinite variety of materials will be on display, some very simple, some extremely complicated. All possess in common the aim of moving more things in less time, with less effort and with less cost. Each in its own way is an engineering marvel, and in this issue we devote some space to descriptions of many of the exhibits. But it must never be forgotten that machines are not ends in themselves, they are only means to an end, and the most efficient gadget will be hopelessly inefficient if its place in the production line has not been most carefully planned to take advantage of all its virtues and with its limitations most clearly recognised. What is the good of putting in a filling machine to fill 200 bottles per minute if the capping machine which follows on has a maximum rate of 100? Absurd, of course, but in this day and age we know of places where such things are done.

A noise annoys

WE like the story, recounted in *Food Topics*, of the little man who walked round Wembley Stadium while the Cup Final was in progress, and collected in a small black tin the energy released from a hundred thousand throats during the 90 frenzied minutes the hard-fought game was in progress. At the end of the match he went home, opened the tin and boiled the kettle on it for his cup of tea.

This story may have originated from the same stable as that of the Irishman who, feeling sad that so much sunshine was prevented from reaching the green land of Erin by the rainclouds which shield it for much of the year, chartered a ship, loaded it with empty tar barrels, and sailed off to the tropics in the hope of collecting enough sunshine in the barrels to brighten the winter gloom at home.

Before we digress any further, let us come back to the point of the first story, which is that sound is energy; to produce it, energy must be expended, and if the sound is unwanted, the energy is being wasted. Which brings us the British Standard No. 661 definition of noise: "sound which is undesired by the recipient." There is certainly a lot of noise going the rounds of British factories at the present time, far too much; food factories in particular seem to be among the worst offenders. A cannery going at full blast, as often as not, might give the passer-by the impression that a thousand shrieking demons were imprisoned inside.

A confectionery plant we recently visited had a large machine working in a confined space, and the noise was frightful. We wonder whether the management had given any thought to the undoubted loss of working efficiency among employees caused by the din. We have been struck on many occasions by the fact that certain types of machine by one maker tend to be noisy, while similar machines by another are silent. This shows that silent running is frequently a function of efficient design; other things being equal, a silent machine will consume less power and will last longer than a noisy one.

For too long has noise and its psychological impact been ignored by industrial designers. But the time is coming when sound will have to be reckoned with when new factories and plants are planned. There are signs that in this, as in many other matters, the big companies will give a lead; at their new cold store at Acton, Walls have soundproofed the dispatch bay to avoid disturbance to local residents. Before this world becomes a bedlam of unwanted sound, let others follow their example.

Floods of soup

SALES of canned soup in the U.K. are now running at about £25 million a year, and of packet soup about £5 million, together equivalent to about three platefuls of soup a person a fortnight, according to the *Financial Times*. This surprisingly meagre consumption supports manufacturers' contentions that there is a lot of room for expansion yet in the soup market.

Soup is in the news again with the entry of Heinz into the packet soup field, and the possibility is not excluded that Campbells, who, in the year or so that they have been operating in this country, have captured something like 8% of the market, may be planning to follow suit, as a subsidiary of theirs on the Continent is marketing this kind of product. Scot-

land seems to be the testing ground for manufacturers' new products; whereas southerners' taste for soup rises and falls with the seasonal temperature, Scottish preferences are more constant; with 10% of the population, Scotland consumes 20% of the U.K.'s soup, with greater emphasis on the packet variety.

Canned soup sales have been rising faster than those of packets, sales of the latter having been almost stationary during the last six months. At the present time, packet soups account for just under 20% of soup sales.

According to the above-quoted report, with increasing competition in the retail trade, the attention of manufacturers is likely to become increasingly directed to the catering trade, for which special packs are produced by most of the major companies. It is estimated that catering sales could amount to as much as one-third of all sales, and this field is a most promising one for future ventures.

Printing inks and wrappers

A CORRESPONDENT writes: "Pressure is growing strong on many ink makers to certify non-toxicity of inks, according to a statement by the American Association of Printing Ink Makers, which gives the assurance that 'no ink maker has yet given such an impossible guarantee.'

"Surely it is time also in this country to examine this subject in a commonsense way. Do people in fact eat printed wrappers? Has anyone ever been heard of as suffering from food wrapper consumption? Is not paper, card or foil an effective barrier against ink coming into contact with food? Are printers and printing ink workers, who deal with their products in bulk, filling the hospitals? Every schoolboy, as Macaulay put it, knows the answers to these questions, so perhaps we can ask some more—How many foods are wrapped so that there is close direct contact of printing ink with the contents, and if so, what are the chances of ink transfer to the food or of anyone eating a part or all of the wrapping? If the wrapper, or part of it, is eaten, what happens?

"Brief answers to these questions are, firstly, that while there are certain foods with close, direct printed wrappings, such as ice cream, lollies, sweets, butter and sausages, the printed side is invariably on the outside of the wrapping material, which acts as a barrier between ink and contents (and in this connection food manufacturers can easily gild the lily of safety if they wish by separating the printed matter from the food with a separate barrier, as indeed some already do). The chance of someone eating a wrapper is very small, and when consumption does occur the risk arising from the ink is nil. What then are we arguing about? To this it must be said that for one reason and another there is a growing concern with food purity, and it may be that more remote contingencies are being given more prominence than they deserve.

"Food wrappers are not intended to be eaten, and printing ink is not a food additive! The amount of ink on even a solidly printed paper or card is a very small proportion of the wrapper weight, and a still smaller one of the food if it were considered as an additive. The wrapper is a barrier, but even if there is some setoff which might transfer (and this is the printer's responsibility) the proportion this bears to the total is so minute as to be negligible."

No harm in being careful

WE agree with the views expressed by our correspondent in the previous comment, although they do not invalidate our remarks in a previous issue (February, 1959, p. 48) that the principle of using toxic inks for printing food wrappers is a bad one. The fact that there is a growing concern for food purity is a very good thing, and the likelihood of getting some aspects out of proportion always exists when a cause is being pursued with vigour. This does not detract from the general argument. Vigilance is always necessary; far better that surveillance in matters of food purity should be overstrict than that something harmful should get by unobserved.

The soft drinks scramble

SEVERE competition in the soft drink market has reduced the number of manufacturers in the field from 1,500 to under 900 in the last ten years, even though the sales have climbed in that time from approximately 200 million gallons to last year's phenomenal record of over 423 million gallons. Soft drinks have followed ice cream in becoming an all-the-year-round commodity, although a fine week-end produces a rush of orders on Monday morning for every manufacturer, and a prolonged heat-wave produces a condition of frenzy after a while.

New products by Lyons and Unilever (the latter's first sally into this field) underline the fact that the market is becoming increasingly dominated by the big firms, with their tremendous distribution advantages over the lesser manufacturer. Distribution is the biggest headache for the soft drink maker; transport and storage costs for bottled products are high in relation to the value of the product, and this accounts for the fact that so many of the 900 manufacturers are small businesses with a very local distribution.

The progress of Unilever's new sachet product will

be watched with interest, doing away as it does with storage and handling difficulties to which bottles are subject, and to the problem of returnable empties. Some think that it will invade a new market rather than compete directly with established lines. Against its convenience must be balanced its cost, 4d. per glass compared with the 2d. odd for a glass of diluted squash.

Those manufacturers who supply compounds to small local bottlers are in a strong position, for they are relieved of the bottle-handling problem and can deliver in bulk, thus cutting costs. It is significant that of the 900 manufacturers, only a score or so have achieved national distribution, according to a *Financial Times* report.

Better late than never!

GREAT decisions need profound reflection, and cannot be dashed into. It is good to know that Government mills, even if they do grind slowly, eventually produce results. Not so fortunate are they who applied for an increase in the import duty on frozen peas; in a notice dated March 10, 1960, the Board of Trade solemnly announce that Her Majesty's Government, having considered the application since November, 1958, have decided to reject it.

A shortsighted decision?

WHAT is one to think of the decision of the Ministry of Agriculture, Fisheries and Food to shut down the dehydration work at the Greyhope Road Experimental Factory in Aberdeen? Is this a shortsighted one on a par with the closing of the microbiological group at Teddington by the D.S.I.R. just over a year ago? It is the Ministry's opinion that the time is ripe for the work to be transferred to industry. Industry, indeed, is very interested, foreign as well as our own; Armour of U.S.A. has provided an accelerated freeze-drying plant to the specification of the Aberdeen staff, and certain big British food firms are known to be taking more than a passing interest in what is going on up north.

The Ministry's statement that only the dehydration work is to be closed down conceals the fact that this work is at present occupying the time of the bulk of the station's 150-odd workers; what employment is to be given them when the work stops has not yet been disclosed. A scientist's work is never done; it is natural that those at Aberdeen feel that much remains to be done on freeze-drying before the technique is ready for commercial exploitation. But commercial competition waits for no man; insulated as they are from the chill winds of economic rivalry, established civil servants perhaps view matters of economic import in a more detached and leisurely way than their brothers in industry. But surely here is a field where collaboration between public servants and industry can go on in a most fruitful fashion, as it does in other fields?

The indecent haste with which the work is being stopped at the end of its allotted time (which was, after all, only an arbitrary minimum period) might give rise to the cynical suspicion that certain of the Minister's advisers are faintly "agin scientists," at least Government scientists. The uncertainty which surrounds some sections of Government departments these days neither helps the staff concerned to give of their best nor does it attract recruits of the right calibre and qualifications.

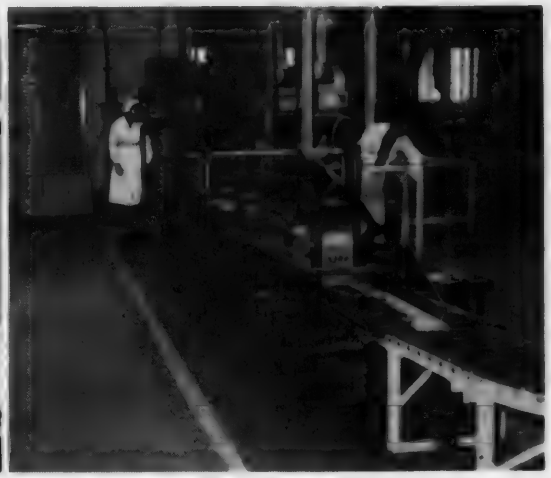
Towards greater hygiene

A FILM shown recently by a pharmaceutical company graphically demonstrated the inadequacy of the established routine of "scrubbing up" to remove pathogenic bacteria from the hands of surgeons before operations, and although the film was, of course, heavily weighted in favour of the company's own products, medical associates assure us that the shortcomings of scrubbing up, even when repeated 20 or 30 times a day, are widely realised in hospitals. This being so, what are we to think of the danger to the health of thousands caused by a lazy worker who, with unwashed hands, comes from the toilet straight to his place of work in the canteen kitchen or at the food preparation table? We heard Viscountess Lewisham recently exclaim with horror that there is yet no regulation compelling a food worker to wash his hands after going to the lavatory. We sympathise with her Ladyship's indignation but doubt whether such a regluation could be enforced.

We know, however, of enlightened food firms who compel their workers to rub over their hands before starting work a bactericidal barrier cream, and here the products of the pharmaceutical company, which been used for many years in the medical field but never before in the food industry, would be of greatest use.

Canned Sparrows?

WITH some astonishment did we read in an American contemporary that canned sparrows are now on the London market in at least two flavours. Bird-loving Limeys, it was reported, have protested to the R.S.P.C.A. Not having heard before of this interesting development in the canned foods field we are agog for further information. What are the flavours, we wonder? Or can it be that our American friends are having their legs gently pulled?



(*Left*): **The rolling machines in which the grits are rolled into flakes.** (*Right*): **A case-packing machine in the cornflake packing department.**

How Latham Foods make Cornflakes and Cake Mixes

First European food acquisition of General Mills, Inc.

When General Mills took over Latham and Co. in July, 1959, it acquired a going concern whose origins date from 1884 and which was the first in the world to market cake mixes. This reputable firm's solidly-established range of cake mixes and breakfast cereals will now be backed by the marketing and advertising resources of the large American company, which plans to introduce new products to the British market under the Latham label. This exclusive article records impressions gained during a recent FOOD MANUFACTURE visit to the Bromborough factory.

NEW products may soon be seen on the breakfast cereal market if plans being developed by General Mills, Inc., come to fruition. On July 20, 1959, the American firm formally took over the control of Latham and Co., Ltd., of Bromborough, Cheshire, and obtained their first foothold in the food industry this side of the Atlantic. At the same time, the company's name was changed to Latham Foods, Ltd.

Latham Foods, which make *Cracka-Jack* cornflakes and eight dessert mixes under the brand name *Cakeoma*, goes back to 1884, when a Yorkshireman, John Latham, established a wholesale confectionery business and bakery in Liverpool. The reputation of his slab fruit cakes and speciality cakes soon spread, and his fleet of horse-drawn vans were delivering them daily throughout the city. In 1896, Latham's products won a silver medal at the International Confectionery, Baking and Kindred Trades Exhibition.

John Latham's fertile mind was not satisfied with resting on these laurels, and realising both the appeal of a home-made cake and the pitfalls awaiting the inexperienced or hurried housewife who tries to make one, he evolved a compromise between the home-made and the bought cake and devised, after many experiments, a recipe containing, in their right proportions, all the dry ingredients for a cake. *Cakeoma*, claimed to be the first cake mixture in the world, was put on the market in 1898 at 3½d. a 1 lb. bag. Four years later this product won a gold medal at an exhibition in Liverpool.

The business continued to expand, and further mixes were introduced; as time went on the wholesale cake business gave way to the new lines. In 1906 the firm became a limited company, and by 1918, compelled by the need to find larger premises, a site in Hackney, London, was bought, and production there was managed

Some of the ovens in which cornflakes are roasted. From each oven the flakes are discharged on to the conveyor belt (over which the operator is bending) which takes them continuously to the inspection and packing sections.

by the founder's son Charles.

In 1936, after some years of experiment, the firm launched into the manufacture of breakfast cereals from maize, a venture which was suspended by the cessation of maize imports on the outbreak of the last war. In spite of wartime difficulties, the manufacture of sweetened cake mixes continued and a wheat-flake cereal product was manufactured.

After the war, the need for further expansion made the board decide to combine the Liverpool and London factories into one, and in 1948 the foundation stone of the present factory at Port Causeway, Bromborough, was laid by Mr. John Latham, then in his 89th year. Production there began in May, 1949, and soon afterwards the other two factories were closed.

General Mills

General Mills, Inc., is primarily a flour-milling company (the largest flour-miller in the world) although it has fingers in many pies. Founded 32 years ago, it has various divisions devoted to producing and marketing flour, grocery products, refrigerated foods, animal feed and oilseeds, as well as a mechanical division making electronic components mainly under U.S. Government contract. A large research centre now being built in stages is scheduled for completion about 1964-5. The firm has a joint interest with a British firm in a Watford company making equipment for the nuclear energy field. Last year, General Mills' sales turnover was $546 million.

Cake mixes

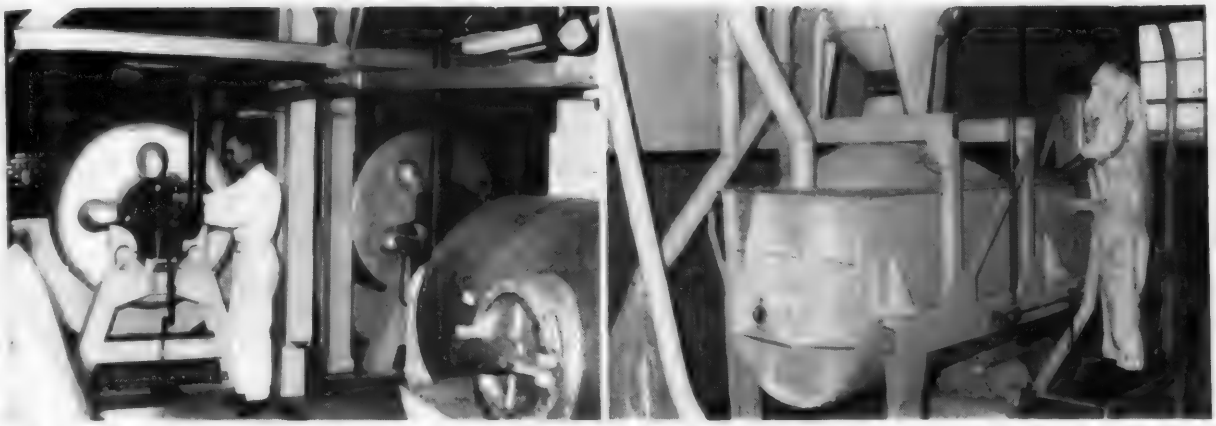
The range of Latham's cake mixes are of two kinds, "complete" and "partial." The former contain all the essential ingredients of a cake and require only the addition by the housewife of egg and milk before baking. Such mixes are the *Cakeoma* Iced Orange, Strawberry, Lemon, Mocha and Chocolate Layer mixes, Sponge Cake Mix and Madeira Mix, some of the cartons containing tinted and flavoured icing mixture for icing and filling the cake.

"Partial" mixes, as the name implies, are incomplete mixes which leave certain ingredients, mainly eggs and fat, to be added by the housewife. The original mix of 1898 was of this kind. Such mixes are *Cakeoma* Cake and Pudding Mix and Tea Cake Mix.

Manufacture of "complete" mixes

The ingredients—flour, baking powder, fat, sugar, flavours, etc.—are all kept in a store room on

Feeding ingredients to one of the general mixing lines where "partial" mixes are made. One of the mixing machines can be seen in the background.



(*Left*): **Some of the rotary cookers where the grits are cooked with sugar, salt, malt and water before being rolled into flakes.**
(*Right*): **One of the mixers used in the preparation of cake mixes.**

the first floor of the factory (the fat, in blocks wrapped in plastic film, is kept in a temperature-controlled room at 65°F. for conditioning).

After being weighed by hand, the ingredients (some of which, such as flavours and colours used only in small proportion, are premixed) are emptied into a hopper which feeds a sieve, from which the sifted ingredients are blown pneumatically to the primary mixer. Batch size is 1,000 lb. or more according to the formula being made up.

Mixing takes place in a trough-shaped vessel fitted with a horizontal rotating axle on which spiral flights are fixed. After being mixed for about 25 minutes, the mix is sampled and a test-baking carried out in the Test Bakery. When the batch has been approved, and not before, the mix is blown pneumatically to the secondary mixer, where the fat is incorporated.

The secondary mixer is fitted with a spiral stirrer having cutting wires parallel to its axis which rapidly cut the blocks of fat into small pieces and incorporate them in the mix. Mixing time is about 4½ minutes.

When the mix has been passed by the quality control department, it is released by gravity into the feed hopper of the semi-automatic filling machines on the floor below. Women seated at the filling units hold bags of greaseproof and moisture resistant paper to the delivery nozzles, while each device automatically weighs and deposits the correct quantity of mix into the bags at a rate of 13 per minute. There are four such weighers giving a total rate of 52 per minute. The filled bags are then placed on a conveyor which takes them to an automatic heat-sealing and crimping machine. The sealed bags are packed by hand into cartons, together with packs of icing sugar which have been previously prepared in another part of the factory. The cartons are then coded, glued and packed in boxes of a dozen.

"Partial" cake mixes

The ingredients are weighed in the store room in the manner already described. From the store room to the ground floor, where the "partial" cake mixes are made up in what are referred to as the general cake mix lines, the weighed ingredients, bags of flour, etc., are taken by an inclined rail conveyor. A signalling system of coloured lights, each colour denoting a particular unit, operates between the mixing lines and the store room, so that the appropriate ingredients can be sent down when required.

The ingredients are emptied into a hopper and taken by bucket elevator to a vibrating sieve, through which they pass down into a mixer. After being mixed for 15-20 minutes, the mix is released by gravity into another hopper below, at the bottom of which is a worm conveyor. By means of this and another bucket elevator, the mix is conveyed to a grinding mill. From this it is taken by bucket elevator to the worm supplying the filling machines.

These machines are generally similar to the semi-automatic fillers on the "complete" cake-mix line already described. Filling, heat sealing, cartoning and gluing is carried out in the same manner.

There are six general mixing lines. One of the lines has five double filling units, the remainder have three each.

Icing sugar plant

There is a separate plant for the production of the various flavours of icing sugar supplied with each packet of layer mix. After being mixed and ground, the icing sugar is filled into bags ready for insertion into the layer cake packets.

Cornflake manufacture

Cornflakes are essentially flavoured cooked pieces of maize grain which have been flattened between steel rollers, then roasted.

Maize is delivered in lorry-loads of about 15 tons at a time, tipped into a hopper, and conveyed by bucket elevator to an automatic scale which weighs 2 cwt. lots. From the scale the weighed grain is conveyed to a separator, which consists essentially of two sets of sieves fitted with air aspiration. Dirt and foreign matter is removed and dusty material is blown away. Handling rate is about 15 tons/hr.

The grain is then elevated to wooden storage bins, of which there are twenty-four, each holding 8 tons. As the grain enters the worm conveyor which distributes it to the bins, it is automatically dampened and its moisture content raised from 14% to 16% for conditioning.

The grain is withdrawn from the bottom of the bins as required and elevated to a steaming worm where it is exposed to live steam. This treatment softens the grains before the subsequent degerming and dehusking processes.

One of the filling lines, showing cake mixes being filled into greaseproof and moisture-resistant bags.

Milling

After being steamed, the grain is milled in a number of corn milling degerming machines which break up the grains and separate the germs and husks. The degerming machine consists of a cone-shaped rotor revolving inside a similarly shaped stator. The surface of the rotor is covered with rounded studs, which break up the grains as they pass between the rotor and stator surfaces. The grains are fed in at the apex end of the mill and the milled material emerges through an aperture at the base.

From the mills the material passes through a rotary dryer where it is partially dried to a moisture content of 11% in a current of hot air heated by gas. After passing through a cooling worm conveyor, the material is fed through two cylindrical rotating reels which remove the meal content, and then through a separator which removes the husk and the germs, leaving the broken grain particles which are known as "grits." The husk, meal and germ material is sold for animal feed.

Cooking

The grits pass to twelve wooden holding bins each of 8 tons capacity, from which they are drawn to feed the cookers. There are six of these, two large and four smaller, of a rotary type and heated by steam. In these the grits are cooked with sugar, salt, malt and water for 2-2¾ hours according to the kind of maize.

Rolling

After cooking, the material falls by gravity into one of four dryers, cylindrical vessels in which it is agitated by stirrers while hot air is blown through.

From the dryers the material passes through another separator to storage bins, from which it is taken by elevator and fed to the ten rolling machines. Each rolling machine consists essentially of two water-cooled steel rollers, the clearance between which can be adjusted.

The cooked grits are fed to the rollers by gravity and fall below on to shakers which sift out the fine scrapings. The flakes are then fed to five continuous gas-fired rotary ovens, and emerge on to a continuous belt which takes them past an inspection point where scorched flakes are removed, to a shaker for removal of fine particles, and then to the hoppers which feed the packing machines. These fill the flakes into laminated bags which are sealed and cartoned in the usual way in 12 oz. *Cracka-Jack Cornflakes* boxes.

In the Test Bakery, every batch of cake mix is test-baked before being filled out. The quality con-

Part of the quality control laboratory.

The men who run Latham Foods. (*Left to right*): **M. H. Smith (Gen. Mills), J. A. Brocklehurst, J. M. Mickle, C. G. Miliotes (Gen. Mills), J. A. Batson (Gen. Mills), J. E. Latham, H. S. Stavely, T. B. Humphrey (Gen. Mills, chairman and managing director), and R. J. A. Reid.**

trol department analyses product samples daily, examines packing materials, checks product weights, correctness of coding and appearance of the packs, and examines all deliveries of raw materials for suitability in use.

The research and development section, consisting of Laboratory and Experimental Kitchen, devises formulæ for new products, compiles directions for use and manufacturing methods, and is continually working on the improvement of existing products. It evolves recipes for the use of the firm's products, examines new materials as they appear for possible use in products, and investigates packing materials and methods.

The firm is proud of its excellent relations with the Good Housekeeping Institute; its cake mixes are among the few such products to carry the Institute's recommendation.

Boiler house

The boiler house has three vertical Cochran boilers with a steaming capacity of 1,760 lb./hr. per boiler. They are oil fired and completely automatic. These boilers supply processing steam for the manufacture of cornflakes. There are also two Robin Hood oil fired central heating boilers capable of supplying 2,000,000 B.T.U./hr. These automatically controlled boilers heat the office and factory.

* * *

Latham Foods, Ltd., have good products and a fine modern factory in which to make them. Small wonder that General Mills considers the firm a worth-while acquisition, and now that the firm's marketing methods are being reorganised with the aid of the American firm's financial backing, its name will no doubt become increasingly familiar to the public.

SUPPLIERS OF EQUIPMENT

Anglo-Scottish Tool Co., Ltd.: case sealing machine.
W. T. Avery, Ltd.: bulk weighing machines.
Brook Motors, Ltd.: electric motors.
Berry and Warmington, Ltd.: bulk weighing machines.
Briggs Engineers, Ltd.: drying cabinet.
A. H. Bland, Ltd.: heat sealing machines.
British Thompson-Houston Co., Ltd.: electric motors.
Crompton Parkinson, Ltd.: electric motors and starters.
Crittall Engineering Co., Ltd.: boiler-house installation and central heating; canteen equipment.
Dunford and Elliott, Ltd.: rotary louvre plant.
Caleb Duckworth, Ltd.: fruit cleaning machine.
Wm. Gardner and Sons, Ltd.: rapid sifters and mixers.
G.E.C.: sanitary incinerators.
Horace Green: electric motors.
Hind and Lund: flour mixers.
Adolph Johnson and Co., Ltd.: rotary steam cookers.
Kenwood Mixer Co., Ltd.: food mixer.
Morton Machine Co., Ltd.: powder mixing machine.
G. C. Pillinger and Co., Ltd.: oil-fired burners.
Henry Simon, Ltd.: washer, dryer, cake mix plant.
Sinex Engineering Co., Ltd.: vibrator sieves.
Sauven Perforating Machine Co., Ltd.: cooling machine.
Southall and Smith, Ltd.: weighing machines.
Sturtevant Engineering Co., Ltd.: vacuum cleaner.
Simplex Electric Co., Ltd.: electrical equipment.
E. and R. Turner, Ltd.: flaking mills, toasting ovens, rotary steam cookers.
Allen West: motor starting equipment.

Food Inspection

MR. H. THORNTON, Chief Veterinary Officer for Newcastle-upon-Tyne, has produced a handbook* catering mainly for the needs of students of Public Health, Agriculture and Meat Technology. This second edition has been brought up to date as regards legislation and, where necessary, the subject-matter also. The book deals simply and comprehensively with the wide range of subjects which falls within this field, without entering into detailed scientific discussions which might merely confuse the student.

Meat is extensively dealt with in all its aspects, from the basic anatomy of food animals, through bacterial and parasitic diseases and pathological conditions to the slaughter and dressing of carcases and the production of prepared meats. There are chapters on poultry, eggs and game, fish and shellfish and milk and milk products: the inspection of other foods, including cereals, fruits and vegetables, confectionery and jams, is also covered.

The illustrations are helpful and clearly drawn. This is a book which might prove useful not only to students but to many who are engaged in catering or the meat trade, or to anyone with an interest in food hygiene.—J. B.

* *The Inspection of Food.* By H. Thornton, B.V.SC., M.R.C.V.S., D.V.H., F.R.S.H., Chief Veterinary Officer, City and County of Newcastle-upon-Tyne. Baillière, Tindall and Cox. 15s. net.

MECHANICAL HANDLING

A FOOD MANUFACTURE review of the Exhibition

Mechanical handling devices range from small hoists to large automatic custom-built factory installations. New and improved equipment is constantly coming into the industrial scene, and every two years is demonstrated at the Mechanical Handling Exhibition at Earl's Court, London. This year's exhibition, from May 3 to 13, is the largest ever held, and occupies the entire half-million square feet of space in the world's largest single-span exhibition building. We review below the equipment likely to be of interest to food processors.

Angel Truck Co., Ltd.

A WIDE range of general handling equipment is being featured by this company, including their new *Flagship* range of light trucks with tubular steel frames and timber platforms, as well as a new range of aluminium alloy sack trolleys. There is a new version of the *Trolifter* and the latest versions of their range of industrial turntable trucks and trailers.

Associated Electrical Industries, Ltd.

In addition to established types, a new range of induction motors, type NC for squirrel cage and type NW for slipring machines, are being shown. Rated from 80 to 285 h.p., these machines, which have class E insulation with 65° temperature rise, will replace part of the existing range with class A insulation. A new type of fractional horsepower motor type BD.2506B, rated at ¼ h.p. at 1,425 r.p.m., is being shown.

Other products on view are geared motor units types RSD and RGD, with double reduction straight spur and helical gears respectively, a wide range of motor control gear for single or multi-motor drives, a working display of static switching, a new type of hydraulic brake in 8, 10 and 12 in. sizes, *Perigrip* brakes, electro-hydraulic thrustors and motor driven pumps.

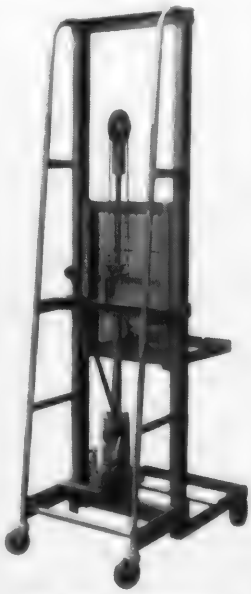
(*Above*): A small section of the conveyor line carrying full biscuit tins at the W. & R. Jacobs factory, made by the Conveyor Division of the Heston Group.

British Wedge Wire Co., Ltd.

This firm's exhibit comprises a complete closed circuit consisting of three different types of *Wedco* conveyor, namely, (i) an *Omniflex* open mesh flat strip belt conveyor travelling along the straight and around a right-angle bend; (ii) a light duty 90° corner conveyor employing a rubber covered ladder belt, which combines the advantages of the smooth flat surface of the rubber belt with a positive drive; and (iii) a *Wair* type conveyor which employs a nylon-centre chrome leather-faced endless belt, and which was primarily

Conveyor systems. (*Left*): **The " LoadaVeyor," made by J. Collis and Sons, Ltd., shown loading a lorry at the factory of W. & R. Jacob and Co.** (*Centre*): **A 130 ft. long woven wire belt " Flexiplane " conveyor made by the British Wedge Wire Co., for handling goods along the straight and around any curve. This one has a right-angle bend and one of the straights is slightly inclined** (*Right*): **A Morris flat belt conveyor handling general groceries in a wholesale warehouse.**

developed for handling trays of prepared food and crockery with unit loads of 30-40 lb. in Lyons' Corner Houses. It has since been developed for the fairly high speed handling of cartons, etc., and can be inclined and negotiate any angle of curve. Included in the circuit is an *Aircush* lowerator which drops loads perpendicularly from floor to floor by gravity only. Also being exhibited is a *Flexiplane* conveyor which employs a woven wire belt which will go round any curve.



A new version of the " Trolifter " which has just been brought out by the Angel Truck Co.

Brush Electrical Engineering Co., Ltd.

This firm are showing a representative selection of battery electric industrial trucks and tractors in working condition, including tractor models T.D., S.D. and R.D.1, and low-loader and high-loader platform trucks. The R.D.1 tractor is a comparative newcomer and can pull loads up to 10 tons. It is of three wheel construction with the drive on the rear wheels.

F. E. Callow (Engineers), Ltd.

The main exhibit on this firm's stand is a complete high pressure pneumatic conveying installation incorporating a positive displacement blower and a rotary blower valve. The conveying line includes a remote controlled two-way valve for diverting the material into two receiving hoppers as required. A multi-way valve is also being shown; this unit can be used in a pneumatic conveying system where a large number of separate pipelines are necessary. Also on view are bulk delivery equipment for fitting to vehicles, rotary valves, exhauster fans and multicyclones, and continuous bladed screw conveyors.

Carter Gears, Ltd.

A representative selection of the ten available sizes of hydraulic variable gear are being shown, including the size AL50, the recently introduced 40 h.p. drive. A working demonstration unit shows the application of the firm's variable speed gear to industrial processes requiring cyclic speed variation.

George Cohen 600 Group, Ltd.

On this firm's two stands are two new Jones cranes, the KL 12-20M and KL 10-10 Mk. III, as well as other examples of the range. A special display features the Jones direct mechanical drive. One of the stands displays a representative selection of the lifting and mechanical handling equipment of all types supplied by the firm, including a new 1 ton lorry loader, the *Bimbo*. Also shown is a typical machine from the firm's hire fleet of fork lift trucks and a roller conveyor display.

J. Collis and Sons, Ltd.

New models of this firm's *TransVeyor* ball assembly for transferring loads of many cwt. in any direction by finger-tip pressure have recently been introduced to meet demand for heavier loading, and the heavy duty type with 2 and 3 in. diameter steel balls are available for capacities of 5 and 10 cwt. respectively. Other types of handling equipment made by this firm are: the *RolaVeyor*, made in either steel or light alloy and usable where the path of travel is either straight or curved; the *MotaVeyor*, a powered belt con-

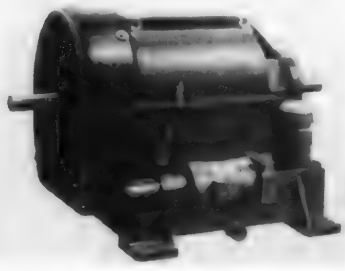
veyor with sectional construction permitting lengthening or shortening as conditions demand; the *LoadaVeyor*, in either belt or slat type, for loading or off-loading in the warehouse and despatch bay where a permanent installation is not required; the *SlatVeyor*, an endless slat conveyor capable of operating at inclines of up to 40°, designed to handle many kinds of loads unsuited to belt or roller conveying; the *VertiVeyor*, for conveying goods continuously up or down from one floor to another in a direct vertical line through a building; and the *Power RolaVeyor*, with powered rollers enabling gradients to be negotiated.

R. H. Corbett and Co., Ltd.

A varied selection of their *Hydrum* mechanical handling products are being shown, including the *Hycaddy* range of battery or mains stackers, the new battery powered *Hydriver* 20 traction unit which can move a load of 2,000 lb. at a continuous speed of more than 2 m.p.h., the *Portapal* pallet truck, a range of *Hydrum* clamps with capacities of up to 6,000 lb. for extending the capabilities of fork lift trucks, the mobile LP 10 ½ ton capacity mains-operated straight line loader, end-on racking, *Hybin* containers, and the Withnell-Corbett wall mounted battery charger.

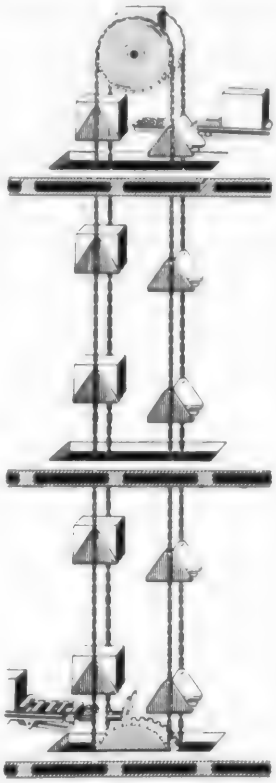
Crofts (Engineers), Ltd.

Among the new items being shown by this firm are the *Par-O-Mount* gear units, the outstanding feature of which is their complete universality of mounting. There are two types, single reduction worm gears and single reduction helical gears. *Autojust* magnetic clutches and brakes are of a completely new design; 13 units are available, from fractional to 45 h.p. Another new type of clutch is the centrifugal-multidisc, and other exhibits show a number of new developments of existing products, as well as a display of power transmission units such as motorised conveyors, motor rollers, flexible couplings and V-rope drives.



A Carter size AL 50 hydraulic variable speed gear.

Lansing Bagnall fork lift trucks being used on " Dock Levellers " made by G. Hunter, Ltd.



The " VertiVeyor," a vertical conveyor-elevator for conveying goods between floors, made by J. Collis and Sons, Ltd.

Crone and Taylor (Engineering), Ltd.

New machines being shown by this firm include the *Unicorn* vibratory paper sack filler with provision for either semi- or fully-automatic filling, and which is adjustable so that 28 lb. or 56 lb. sacks may be filled and sealed at six per minute; and the compact 20 ft. centres 18 in. belt lightweight *Caterpillar* conveyor which is provided with a motorised drum and dished belt for bulk or package handling.

Dallow Lambert and Co., Ltd.

Dust control equipment is displayed on this firm's stand. A complete range of the new *Unimaster* units is being shown; these are designed to eliminate almost every type of dust produced by machines and processes, and can be supplied with a variety of fans and motors, filters and dust containers. A collector particularly applicable to mechanical handling is the *Unimaster* venting dust control unit designed to handle dust problems arising from pneumatic conveying systems.

Eccles (Birmingham), Ltd.

Some new machines among an extensive range of lifting and pallet trucks, with load capacities of 10 cwt. to 5 tons, are being shown. There are three new models of lift-

(Left): **A new double-lift hydraulic elevator made by Gramac Grading Machinery, Ltd., which can carry up to 6 cwt.** *(Right):* **An air-operated " Hycaddy " stacker for use in inflammable goods stores, made by R. H. Corbett and Co.**

ing truck with a capacity of 30 or 40 cwt., each with a lift of 3 in. A new twin-fork pallet truck which is also on view can be modified if necessary to suit non-standard pallets. Another new piece of equipment is a long load lifting truck.

Electropower Gears, Ltd.

This firm is showing a fairly comprehensive range of gearboxes and speed reducers, worm geared motors and one or two types of variable speed drives. Their general range covers from 1/16th to 250 h.p., with a large range of speeds. A high speed unit is also being shown, available up to 50,000 r.p.m. and from ¼ to 400 h.p. New additions to the range are several hand lever change ratio geared units. A number of units are being shown in motion.

English Electric Co., Ltd.

This firm is showing an electric motor with heavy duty bearings, robust shafts and out-of-balance weights at each end, specially designed for operating a mechanical vibrator for accelerated withering of tea leaves. It has many other applications.

Ewart Chainbelt Co., Ltd.

This firm is showing a wide range of malleable iron and all-steel conveying and driving chains, together with conveyor and elevator accessories. The range of steel chains has been increased to include a heavy duty conveyor chain of 330,000 lb. ultimate strength. Working scale models of two handling systems are being shown, one incorporating finger tray elevator, and slat and gravity roller conveyors for handling packaged goods in a closed circuit. Full size working models will also be featured, one of which will comprise three tiers of monorail conveyors using three different types of chain handling a variety of goods, whilst the other will be a closed circuit bulk handling scheme consisting of a vertical spiral elevator feeding a horizontal drag link conveyor which in turn feeds a horizontal spiral feeder by means of a vertical chute. The feeder in turn delivers the material to the base of the elevator, thus completing the circuit.

Firth Cleveland Instruments, Ltd.

This firm is exhibiting the Gilbarco-Firth Cleveland electronic tank contents gauge, which measures liquid levels to an accuracy in the field of within 1/16 in., or in the laboratory, of within 1/64 in. Also shown is the associated equipment, the remote reading receiver unit.

Shown for the first time are a number of new instruments, including a miniature recorder, and several level detectors and controllers for use with liquids or granular solids. One of the level detectors is believed to be unique; it consists of a stainless steel vibrating probe whose oscillation is damped by contact with a liquid or semi-solid, suppression of oscillation being used to operate a relay.

Gandy, Ltd.

This firm is showing a range of conveyor belts and friction mater-

ials. Among their belts of interest to the food industry are the following: *Sidewall* plastic coated, a flat-base belt with walls, hygienic and easily cleaned; *Polywocotring*, a white non-toxic food quality plastic belt with a rough surface for carrying materials up inclines; *Proudrib*, a cotton belt with longitudinal ribs of heat-resistant terylene, designed to convey hot tins in bakeries; and *Crossrib*, a cotton belt with a much rougher surface for taking such materials as tea up inclines. Both the last two can be obtained with a nylon plastic finish and with sidewalls.

Gramac Grading Machinery, Ltd.

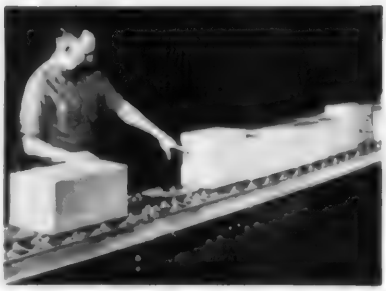
New machines which this firm are showing are a lift stacking and loading truck and a twin carriage hydraulic portable elevator. The first, Mk. 100A, 5 cwt., 5 ft., is mobile and has a ram-pump unit of 1,100 lb. capacity with 30 in. stroke and two speeds for heavy and light loading. The elevator has a 16-24 ft. boom which carries a 2 cwt. unit load, or 6 cwt. spread over the boom, has a forward or reverse speed of 35 ft./min., is controlled by one lever only, and can be additionally fitted if required with limit switches and brakes on the castors.

Guest, Keen and Nettlefolds, Ltd.

This group are featuring their range of fasteners, screws and nuts, friction grip bolts and special forgings, and examples of the protection against wear and corrosion afforded by the electrodeposits of their finishing division.

Hamworthy Engineering, Ltd.

Their hydraulics division is exhibiting a full range of hydraulic pumps and fluid motors and control valves for material handling and mobile equipment. The pumps and motors are of the gear displacement type to ensure freedom from dirt troubles and to withstand shock loads. They have pressure balanced wear plates for keeping the volumetric efficiency high at all pressures and for maintaining accurate clearance between



A "Rapistan" APC conveyor made by Manufacturers Equipment Co., Ltd. In stop-and-go operations, only ounces of force are needed to stop the forward movement of an entire carton line without shutting down the conveyor unit.

The new "Brimpex" auto-valve lifter gives fully or semi-automatic lifting, or complete and sensitive hand valve control. It is made by Industrial Machine and Equipment Co.

the plates and the gland faces. Pumps are made in various sizes up to 90 gal./min. and certain models are reversible; fluid motors are available with outputs from 14 to 50 h.p., all being reversible. The control valves are available in a range of sizes to control flows up to 80 gal./min. and up to 2,500 p.s.i. with single acting, double acting or float control plungers, all with built-in relief valves.

Heston Aircraft and Associated Engineers, Ltd.

This firm is displaying examples of its handling service to the food industry; Heston conveyors and *Phoenix* trays and containers are, without exception, tailor-made to the requirements of individual customers. No trays or containers are made from stock, and no conveyor components are prefabricated from standard parts; the conveyor division offers a complete design and production service, from appraisal and advice (without obligation) to final construction in the plant.

Phoenix aluminium alloy interstacking trays and containers are designed for use with both the conveyor systems and with the *Sherpa* range of mechanical handling equipment. *Sherpa* trucks can be custom-built for special purposes, but there is a standard range from 2½ to 15 cwt. capacity (the new Model 12 lifts 15 cwt. to 10 ft. in 40 secs.). For palletised loads or with drum handling attachments, there are electric fork lift trucks claimed to provide low-cost handling that is safe, simple and clean. The range includes hand-operated and electric lifting tables, self-propelling petrol and electric dumpers, tugs and trailers, tipping vehicles, elevating stillage and platform trucks, together with a wide range of accessories.

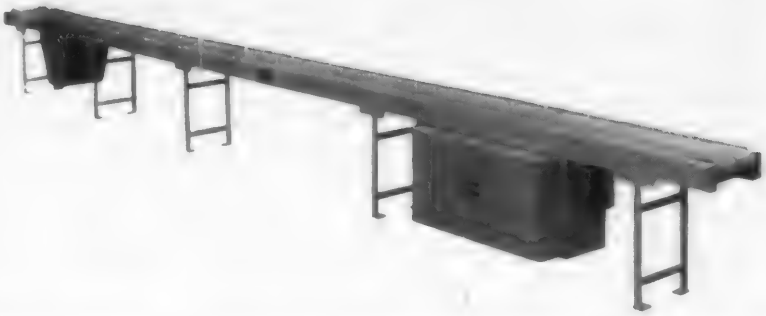
G. Hunter (London), Ltd.

This firm is showing the new *Piccolift* fork lift truck for the first time. It is designed to be especially useful in confined spaces and has a low weight. The truck has a fast lift and travel speed. Also being exhibited is the counter-balanced dock leveller which bridges the gap between the loading dock face of a despatch bay and the tail board of road vehicles, enabling pallet and fork lift trucks to run on to the lorries with palletised loads.

One exhibit shows a hand pallet truck adapted by having a stores ladder fitted on to it; as soon as a man steps on to the ladder, the truck is effectively braked.

Industrial Machine and Equipment Co. (Brimpex), Ltd.

New *Brimpex* lifters being exhibited for the first time include the auto-valve lifter, an all-purpose machine for raising and



The " Masterveyor " conveyor for food handling, made by A. L. Marshall, Ltd.

lowering loads up to 2½ cwt. by three methods: fully automatic lifting, in which the platform goes up immediately the load is put on, and goes down when it is taken off; semi-automatic lifting, whereby the platform is loaded and the automatic action is engaged by operating the foot trip; and complete hand valve control, for lowering or inching up and down at the turn of a lever. Other *Brimpex* machines on view include mobile automatic machines lifting to a height of 13 ft., stackers with a capacity of 7 cwt., barrel lifters and interfloor lifters.

Keelavite Hydraulics, Ltd.

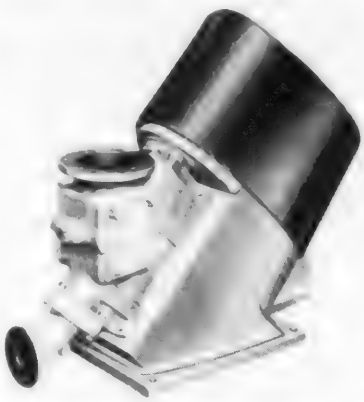
This firm is exhibiting power transmission equipment, covering all types of hydraulic actuators and controllers. The G.P. lightweight gear pump series have capacities from 4 to 33 gal./min. at 1,000 r.p.m. Shown for the first time is the heavy duty pump/motor unit made in three sizes, 10, 20 and 36 gal./min. at 1,000 r.p.m., with a maximum continuous pressure of 2,000 p.s.i.

Geo. W. King, Ltd.

Conveyor installations for large manufacturing processes are the main theme on this firm's stand, the principal exhibit being a light *Dual-Duty* overhead conveyor. A new item is the *My-te-Min* mark II electric chain pulley block, of which four models, from ¼ to 1½ tons, are available.

W. Langley and Co., Ltd.

There is a varied range of *Jacaddy* hydraulic trucks on view,



The Mono Junior powder pump, for discharge rates up to 5 cu. ft. of powder per hr., is a useful unit for small batch powder transfer and dosing.

for handling loads of up to 10 cwt. with lifts up to 10 ft. The model JU for 10 ft. lift has telescopic mast and mains power operation. Also being shown are a drum stacker with battery power and a number of trucks incorporating hand-operated multi-speed pumps. A working set of *Neway Autoflex* automatically operated flexible rubber doors are on show for the first time.

They are operated by compressed air which can be actuated by a pull chain, push button or other methods. They may also be used as crash doors.

Lansing Bagnall, Ltd.

A newcomer to this firm's range of mechanical handling equipment is an electric fork truck suitable for both indoor and outdoor use. Other exhibits include reach trucks, and power pallet and stillage trucks.

Light Alloy Construction, Ltd.

This firm claims to make the world's largest range of light alloy containers, and on display will be the *Lacon* range of containers and an entirely new range of light alloy ladders which includes what is probably the world's longest ladder, 48 ft. long. These products are made from heat treated light alloy which is further toughened by heat precipitation ageing.

The *Lacon* range includes the *Tracon* one-piece folding container, *Palcon* one-piece pallet containers and tote bins, *Latrol* trolleys, including the W.100, a wheeled container, the *Hanbox* K.200 general purpose container, and light weight mobile trolleys.

Manufacturers Equipment Co., Ltd.

On show is the new *Rapistan* A.P.C. pressure-sensing conveyor, which accumulates cartons on the line without increasing line pressures, releases accumulated cartons one at a time with automatic spacing, and transports them. Spring-operated pressure wheels exert the right pressure against cartons regardless of belt tension, reducing, it is claimed, belt tracking problems, maintenance costs and power requirements. Also on show is the *Magnetic Press Veyor* for conveying ferrous items; one man can roll it into tight spots in a crowded room, fitting it under low delivery chutes and over tote boxes, and it can be switched on and left to attract production parts or scrap while the operator continues with production.

The firm's stand features a complete conveyor system at work, which includes roller and wheel conveyor, power conveyors, spur curves, and the *Rapid Power Booster*. Claimed to be an important feature of all *Rapistan* conveyors is the ease and speed with which any combination of units can be changed, moved or reassembled.

A. L. Marshall (Carlton), Ltd.

On this firm's stand is a representative display of their conveyor equipment, including: the *Masterveyor;* a circulating conveyor

with turntables; the *Extendaveyor* band conveyor; the new *Handiveyor* portable conveyor-elevator; a retractable roller conveyor, varying from 8 to 24 ft.; and a chain and wood slot conveyor.

The Metal Box Co., Ltd.

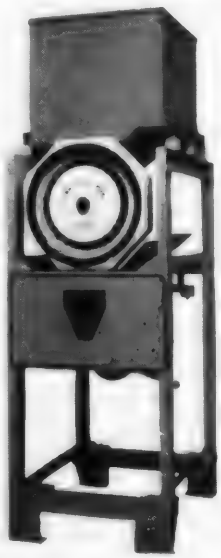
This company is showing conveying equipment of its own manufacture, principally as a service to its packaging customers. The chief exhibits are: a conveyor for cans or similar objects, in which the conveying element is a wire rope on which the objects are carried on guide rails on a climbing zigzag course from ground level to a height of 11 ft., together with associated electronic counting and batching, and colour selectors and regulators of unwanted objects; a return-flow bagging unit, comprising a prepackaging conveyor for packing and weighing into plastic bags; a standard belt conveyor for cartons, etc.; a magnetic elevator for metal containers or similar objects; and a carton forming machine.

Mono Pumps, Ltd.

On this company's stand are several demonstrations indicating the versatile application of the *Mono* pump to industrial handling problems. The new Junior powder pump is being shown for the first time. It is a small compact unit for pumping powders for batch transfer, for dosing or blending, or for bleeding off small quantities of powder from draw-off points. Its rate of discharge can be varied up to a maximum of about 5 cu. ft. of powder per hour. Various demonstrations on the stand indicate how the larger *Mono* powder pump and the Junior powder pump can be used on ring main piping systems, and how a combination of the two pumps can assist in dealing with both continuous and intermittent discharge from draw-off points.

The display also includes working demonstrations of pumps handling solids in suspension and abrasive slurries, and a representative selection of cast-iron and stainless steel pumps. A model shows how that geometrical curiosity, the hypocycloid, provides the characteristics of the *Mono* pump principle.

A Mucon flexible sleeve valve for control of powdered or granular solids, slurries and air. The aperture is infinitely variable from fully open to closed by means of the rachet lever control shown right.



An exhibit on the stand of S. Parsons and Co., Ltd., which demonstrates the automatic control by weight of free-flowing material.

A cut-away drawing of a "Thorite" motorised drum, made by Richards Structural Steel Co., Ltd.

Herbert Morris, Ltd.

This firm's exhibits are housed in two stands. One shows a complete handling scheme in operation, incorporating various types of Morris conveyors, such as an overhead chain conveyor, gravity conveyor, twin finger tray elevators and a belt humper with automatic loading and discharge features embodied in the conveyor circuit. The other stand features a Morris push-button controlled electric overhead crane, and several swing-jib cranes each having a different type of hoisting unit. Included is a lever pull-hoist.

Mucon Engineering Co., Ltd.

This firm's exhibit demonstrates the infinitely variable non-metallic orifice of Mucon valves. This type of valve, which is not suitable for liquids, has a flexible diaphragm forming a concentric aperture which can be infinitely varied from fully closed to wide open by moving a ratchet lever through 180°. It is claimed that the fabric diaphragm will withstand many months of hard wear and can be cheaply replaced by unskilled labour in a few minutes. It is designed to control the flow of all free-flowing solids such as dried food powders, and powdered and flaked gelatine, in weighing, blending, bagging and similar operations. The standard fabric for the valve sleeves is nylon, but other fabrics can be supplied.

Fred Myers, Ltd.

On this firm's stand are shown a range of Hyster and Hyster-Ransomes fork lift and industrial trucks. Lift trucks vary from 2,000

A " Vertolifter " telescopic drum stacker and a " Stak-a-Drum " drum pallet, made by Powell and Co.

to 40,000 lb. capacity, powered by petrol, diesel and LP gas engines. The complete range of the battery-powered Hyster-Ransomes NR series lift trucks are being displayed with capacities from 1,000 to 5,000 lb. at 24 in. centres, and a variety of tractors and platform trucks and attachments. The *Monotrol* transmission system is shown for the first time outside the U.S.A.; this is fitted to many of the exhibits. New to Britain is the S100 cushion-tyred lift truck with a capacity of 10,000 lb., and the massive H400, with a capacity of 40,000 lb. makes its first appearance in Europe. The first production models from the Hyster Co.'s new Scottish plant are being given pride of place.

R. H. Neal and Co., Ltd.

A representative selection of this firm's wide range of mobile cranes is being shown, including machines from 15 cwt. to 25 tons capacity. Specialised items of handling equipment such as the *Pelican* loader and the lorry loader are made by this firm.

S. Parsons and Co., Ltd.

Among the items of this firm's weighing equipment which are on display are an electromagnetic feed control unit, a drum filling unit with automatic taring, an overhead track weigher for weighing goods passing along an overhead conveyor, a dial bench scale fitted with a length of roller conveyor to demonstrate how a weighing machine can weigh articles passing along a roller conveyor system, and various control headworks showing the different types of cut-off devices that can be fitted to any of Parsons' weighing machines. An autographic recording unit illustrates the Parsons system of weight recording.

Paterson Hughes Engineering Co., Ltd.

The handling of steel plates of all sizes is one of the many aspects of this firm's lifting and conveying equipment which are being demonstrated. Also being shown is the new P.H.5 electric hoist block of 1 ton capacity, specially designed to incorporate all the advantages of a totally enclosed block with great accessibility for maintenance and economy in initial and running costs. The Crane Division is demonstrating an electric overhead travelling crane, which incorporates limit switches, long travel drive and other desirable features.

Pollard Bearings, Ltd.

One of the main displays on this firm's stand is their range of *Self-Lube* self-lubricating, self-sealing, self-aligning ball bearing pillow blocks and bearing units. These bearings are especially useful for conveyors, stackers, elevators, grain handling equipment and many other types of mechanical handling plant and special purpose machinery. A *Self-Lube* unit consists of a self-aligning ball bearing capable of withstanding both radial and thrust loading, mounted in a housing which can easily be fitted to any piece of equipment without the necessity of precision machining of adjacent parts. Each unit is injected during manufacture with the correct quantity of high grade grease and then sealed off for life by the Pollard dual seal. A test rig on the stand demonstrates a number of *Self-Lube* units operating in simulated desert sandstorm conditions; another test rig

A telescopic stacker which can lift a load of 1,500 lb. to a height of 12 ft., made by Powell and Co.

shows various applications, such as the taking up of slight shaft misalignment. Also on view are examples of *Max-Load* high capacity roller bearings and solid and flexible roller bearings.

Powell and Co.

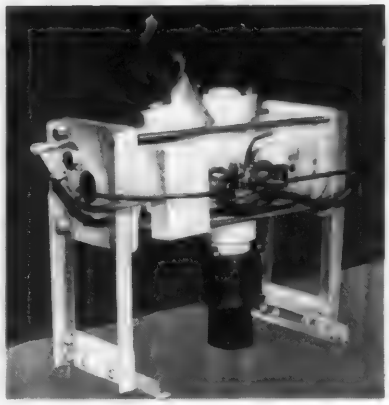
A new telescopic stacker in the *Vertolifter* range is being shown. This range includes different models from 500 to 1,600 lb. capacity, with special adaptations, *e.g.* for drums. There are also examples of the recently introduced *Quik Lift* elevator truck, a modification of this for sacks and churns is now available. Another recent introduction is the *Stak-a-Drum* drum pallet, with which a drum can be lifted from the ground to the pallet using the same fork centres as for lifting the pallet. They can be lifted from the front or side, and stacked up to five tiers high. The firm has a wide variety of trucks and stands for the safe handling of drums, barrels, bins, carboys, cases, etc. In most cases this equipment enables one man to lift or move a standard 40/50 gal. drum or other container on his own in safety.

Powell Duffryn, Ltd.

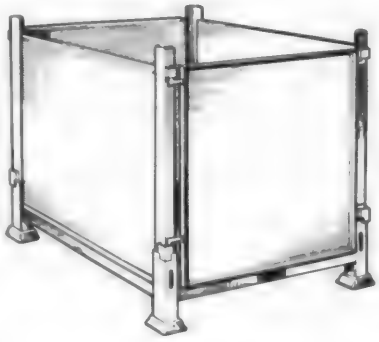
A completely new range of mechanised equipment for handling bulk process materials of many types, waste products and general refuse, known as the *Dempster-Dumpster* systems, is being shown. The system comprises an integrated one of vehicles and containers, using most makes of commercial chassis and cabs. Containers of various types from 1 to 15 cu. yd. capacity and up to 9,000 lb. laden weight can be lifted to a dumping height of 10 ft., or automatically self-loaded into compaction bodies of 18, 24 or 30 cu. yd. One vehicle, the *Dinosaur*, can pick up or set down hydraulically its own body of up to 40 cu. yd. capacity.

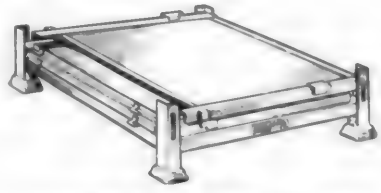
Richards Structural Steel Co., Ltd.

This company is exhibiting its *Thorite* motorised drum which can be incorporated into conveying equipment needing electric motive power and reduction gearing. It requires no routine maintenance and can be easily and rapidly installed, it being necessary only to fit the revolving shaft into a self-aligning plummer block, the stationary shaft into a fixed retaining bracket, and to connect a 3-phase supply to a junction box. All electrical and mechanical parts are sealed within the drum shell, and the only point between the fixed shaft and the rotating drum through which oil could escape or foreign matter enter is sealed with an exactingly tested oil seal. The electric motors range from fractional to 20 h.p. The epicyclic reduction gears have a wide range of speeds. There is a wide range of drum diameters and widths, and the standard drum shells are crowned. Electromagnetic brakes or backstop devices can be fitted. Flameproof models are available.



This electro-pneumatic divertor valve is one of the components in the working pneumatic conveying exhibit on the stand of Thos. Robinson and Son, Ltd.





A medium-light collapsible container suitable for storing and transporting perishable items, made by Rubery Owen and Co., Ltd.

Thomas Robinson and Son, Ltd.

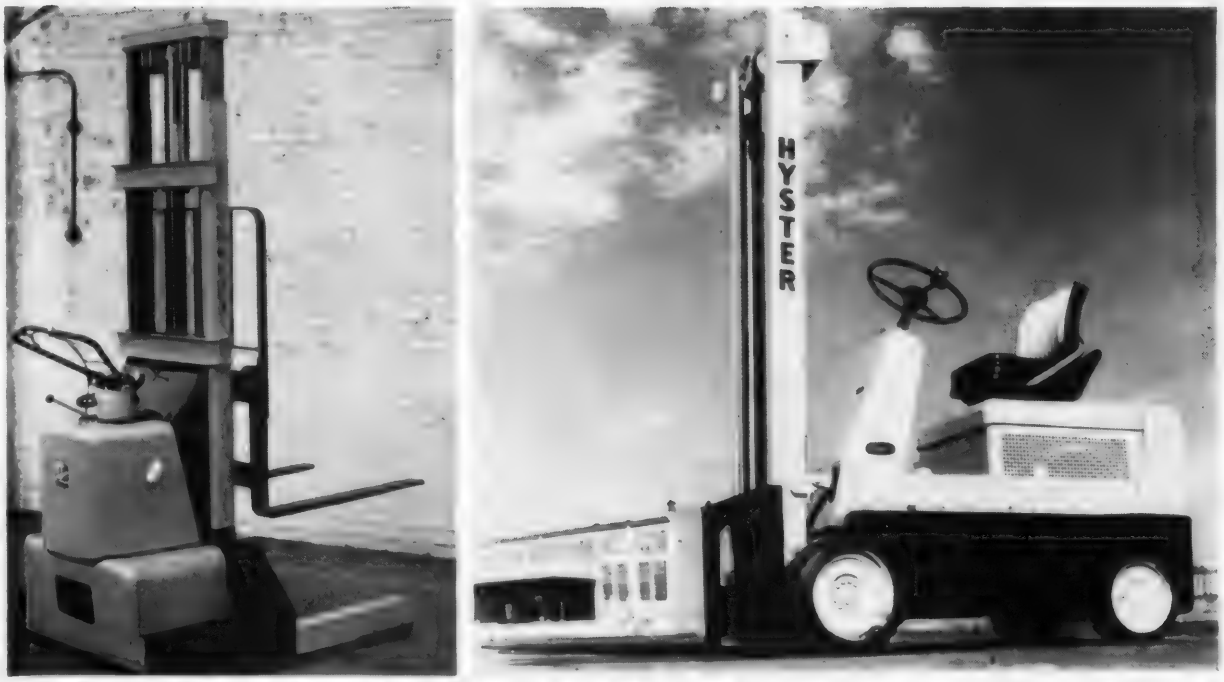
This firm is exhibiting a working pneumatic conveying plant, electronically controlled and incorporating electrical weighing equipment, as well as a compact sifting machine and gravity and chain conveyors. The pneumatic conveying exhibit demonstrates the firm's *Pneu-Flow* pressure conveying system, which has controls and load cells made by Elliott Bros. The system is designed for the bulk handling of powdered and granular products, and incorporates a blower which supplies the conveying air stream in a small diameter conveying pipeline Stock is fed into the pipeline through air seal rotary feeders which vary in type according to the nature of the material. The stream can be diverted to any number of points by air-energised valves, and batch weighings are made in a weigh bin mounted on load cells.

Rownsons (Conveyors), Ltd.

A bulk handling circuit, a powered unit package handling circuit, and individual working and static units from this firm's range of products are being shown. The bulk handling circuit comprises a screw conveyor, a vibrating conveyor and screen, belt conveyors and bucket elevator operating as a continuous circuit. Individual units on view include an overhead link type conveyor, a *Nuway* gravity conveyor truck, *Smoothline* and *Nyloroll* gravity rollers, *Nylowheel* skate wheel conveyor, a ball castor table, and *Zipper* belt conveyor sections.

Rubery Owen and Co., Ltd.

Exhibits of interest to the food industry include a wide range of pallets, stillages, tote boxes and work pans to suit all types of goods



Fork lift trucks. (*Left*): **The " Sherpa " model 12 stacker made by Salisbury Precision Engineering, Ltd.** (*Right*): **This Hyster S50 is a 5,000 lb. capacity lift truck in the " Spacesaver " range, supplied by Fred Myers, Ltd.**

and lifting appliances. A large mesh box pallet is suitable for use in the early preparation of pre-packed goods such as biscuits in tins or any application involving bulk delivery packages. It comprises a timber floor, three fixed sides and a lid with hinged locking doors for easy access. Other exhibits are a light-to-medium container for storing and transporting perishable goods, with two hinged sides, and a wire mesh box pallet with removable gates particularly suitable for use in the canning industry.

Russell Constructions, Ltd.

An addition to this firm's range of sieving and straining machines is the *Liftip* hydraulic lifting machine for sacks and drums, which not only lifts these items but also tips their contents into any hopper, mixer, etc. by the operation of a lever. The firm's latest *Invicta* screen, claimed to be the most powerful sieving unit available to industry, is also on view, as well as a range of other screens.

Salisbury Precision Engineering, Ltd.

Centrepiece of the *Sherpa* stand is the self-propelled model 12 telescopic stacker, already described under Heston Aircraft and Associated Engineers, Ltd., with which the firm is associated.

ScotMec Works

The centrepiece of this firm's stand is the *Big Joe* all-electric hydraulic fork lift truck, which is claimed to be the cheapest in Europe and is supplied complete with battery, built-in battery charger and slip-on platform. There are two models, *Big Joe 1,000* (1,000 lb. lift) and *Big Joe 1,500* (1,500 lb. lift) with lift height of 4 ft. 9 in. and turning radius of 38 in. Other exhibits are oil or gas fired *Teleheaters* for conveying clean hot air to the working area, and items from the firm's range of grain handling equipment, the *Two-Tonner* hammermill, a high-output grain blower and an OGA Auger grain conveyor.

Simon Handling Engineers, Ltd.

The principal exhibit is an automatic proporting unit, of a type which can be used where materials are measured out in batches for mixing and processing. Units can be designed to handle virtually any number of materials and to cater for variable formulæ and for single or repetitive batching. Weights of materials to be handled can vary from minute amounts to 7,000 lb. Units are custom-built for each application and can be designed to incorporate any necessary safety devices, cycle timing, and integrated control of storage, conveying and processing. Sequence indicator lamps enable faults such as material shortage to be located at once.

Spencer (Melksham), Ltd.

The Dunn-Spencer transporter vehicle is being demonstrated. It is designed to collect, transport and off-load granular and powdered materials such as wheat and animal foodstuffs. It is available with various types of chassis and bodies to suit particular requirements, and is a self-contained unit requiring only a driver to operate it. A 20-min. colour film which the firm have prepared on the recent Huskisson Dock, Liverpool, project for Tate and Lyle, Ltd., showing the part the firm have played in building the mechanical handling equipment for the raw sugar intake plant, is being shown on the stand.

E. G. Steele and Co., Ltd.

On display is a *Locopulsor* shunting machine for shunting railway wagons in works sidings. This machine can push over 150 tons on a good level track with the very small petrol consumption of only 3 pints per hour. Its capital cost is very modest.

Steels Engineering Products, Ltd.

This firm designs and manufactures *Coles* cranes, and are showing a representative selection of their wide range of diesel-electric cranes; three of the five cranes on view are being shown for the first time. The models being displayed are: the *Pyrrhus* self-propelled crane with 20 ft. cantilever jib; the *Aeneas* self-propelled crane with electrically operated telescopic cantilever jib; the *Dominant* self-propelled crane with 50 ft. centres strut-type jib and wide chassis; the *Endurance* truck-crane fitted with a 100 ft. centres strut jib; and the *Ranger* self-propelled tower crane with 50 ft. centres strut jib. The last three are new items.

In addition, four truck-mounted cranes are being shown in the exhibition forecourt.

Richard Sutcliffe, Ltd.

The principal exhibit is a conveyor circuit comprising two main conveyors, one electric and one hydraulic. Included in the circuit is a short cross conveyor, a chute, belt weighers and a batch weigh hopper. Also being shown is a multi-blade conveyor belt scraper, especially designed to overcome such problems as excessive wear in the centre.

F. Taylor and Sons (Manchester), Ltd.

Four from the range of *Jumbo* diesel-hydraulic self-propelled cranes are being shown. They are: the series 46, lifting 3 tons at 10 ft. 6 in. radius; the series 48, a 3 ton slewing grab crane with power-operated telescopic jib; the series 42, a 4-wheel drive crane lifting up to 4 tons; and the series 66, a truck-mounted slewing crane lifting up to 2 tons.

A Simon control panel in a modern biscuit factory, from the centre section of which is controlled the batch weighing of flour and wholemeal before their pneumatic transfer to the dough mixer receiving bins. Delivery from the storage bins, blending and feeding to the service bins is also controlled from this panel.

Thos. W. Ward, Ltd.

On this firm's stand are being shown: the *Fluid-Lift* pneumatic handling system for powdered and granular materials, operating on small amounts of air and large amounts of material; the *Ensign* portable bulk piler, which can be fitted with electric, diesel or petrol drive; the *Ensign* portable flat belt conveyor, which has a tubular welded boom with hydraulic telescopic masts for horizontal or inclined working; and a package handling circuit showing various types of conveyors and including the *Ensign* unit construction flat belt conveyor, 90° power roller bend, 90° taper roller gravity roller bend, *Ensign* inclined slat conveyor and lowerator, and *Rolarail* gravity section.

Wingrove and Rogers, Ltd.

This firm is showing a number of elevating platform and high lift fork trucks, including the type E.116, a 1 ton rider-driven truck, the *Leader*, a pedestrian controlled elevating platform vehicle available in 2 and 3 ton capacities, the type RH.11, a 1,120-1,500 lb. capacity truck, and others. Also being shown is the type S.717, a rider-driven fixed platform truck with a nominal load capacity of 2 tons, for service in and around factories.

The Yale and Towne Manufacturing Co., Ltd.

A KD51 diesel fork lift truck of 4,000 lb. capacity is being shown for the first time. This has a laden lifting speed of 57 ft./min., and a laden lowering speed of 79 ft./min. A new 2,500 lb. capacity hydraulic hand pallet truck is also being displayed. This can handle loads of up to 1 ton.

A feature of the stand is a display of the firm's range of hydraulic attachments for fork lift trucks, and of the complete range of hoists and *Pul-lifts*.

W. C. Youngman, Ltd.

This firm is introducing for the first time their new *Slalom* trailer truck, which follows exactly in the path of the towing vehicle, and which converts in a few seconds into an easily-operated floortruck. In addition, their range of stillages, pallets and pallet converters, which can change flat pallets to post pallets and allow fragile and crushable items to be tiered with safety, are being shown.

FOOD MANUFACTURE
ANNUAL REVIEW

MEAT

By F. J. Mallion, F.R.S.H., M.Inst.M.

Home production ★ experiments ★ imported supplies ★ technical advances and new machinery

THE year 1959, while not being as spectacular as that of 1958, nevertheless has provided the meat industry with two main talking points, one being the heavy supplies of lamb and mutton, both home produced and imported, which have come forward throughout the year, resulting in depressed prices in wholesale markets. A comparison of London wholesale prices is shown in the accompanying graphs.

These low prices have led to speculation as to whether the market is at, or near, saturation. Provisional figures for domestic consumption of mutton and lamb, however, indicate that demand is increasing, even if not at the same rate as supplies. It is probable that domestic consumption will be approximately 3 lb. per capita more than last year.

The other matter which has been the cause of much discussion is the serious decline in pig numbers, particularly with regard to breeding herds. The recent Agricultural Census, however, indicates that this may have been arrested. There had been a decline in the breeding herds since the guaranteed price of pigs was reduced at the 1958 (February) Price Review. At that time, the Subsidy bill was in the region of £40 m. per annum, and appeared likely to increase. Breeding herd numbers in England and Wales had declined from 682,000 in March, 1958, to 550,000 in June, 1959. Since then it had remained constant. If past experience is repeated, an increase could be expected in the near future. The Minister of Agriculture, Fisheries and Food has already announced that guaranteed prices for pigs, will not be reduced at the 1960 Price Review.

HOME PRODUCTION

Home beef production showed a slight reduction on 1958, though it would appear from the greater numbers of calves retained for rearing, that an increase could be expected in 1960.

The proportion of home-produced beef had increased from below 50% in 1938 to 67%, which had been mainly achieved by obtaining beef from the dairy herds, and the extensive use of artificial insemination. Since the use of artificial insemination commenced on a commercial basis some 15 years ago, over 10 million calves have been bred by this method and, at the present time, it is estimated that three-fifths of calves born in the United Kingdom are produced from artificially inseminated cows. Expert opinion takes the view that it is unlikely that more beef could be produced from the dairy herds without prejudice to dairy heifer replacements, the proportion of home produced beef from this source having reached about 35% of total beef output. Therefore it is from other systems and rearing techniques that further increases in home beef output may be expected. Included among the systems being investigated are those of multiple births, progeny testing of bulls and the use of hormones either by direct implantation or by feeding.

The present consumer demand for lean, tender meat had a wide impact on production methods and cattle were slaughtered at an earlier age and consequently lighter weights. Three cattle were now required to produce the weight of meat given by two less than ten years ago. Such beef, however, is expensive to produce and its high cost is reflected in the retail price.

About three million cattle were killed annually in this country, but, because of diminishing overseas supplies, this figure needed to be increased by 500,000 or an equivalent increase achieved in the total beef yield.

Beef and dairy crosses

The increased amount of beef being turned off dairy farms in Britain was reflected in the new class for "beef from dairy herds" which were included for the first time in the Dairy Show's history, an Aberdeen Angus cross Dairy Shorthorn being adjudged champion beef-dairy animal at the 73rd Dairy Show. The champion weighed 7 cwt. 1 qr. 16 lb. at 11 months of age, a remarkably good effort on the part of its rearers.

This new class attracted 30 entries and was dominated by British Friesians. It is probable that a far greater number of entries will appear at the 1960 Show.

Classes for dual-purposes dairy beef breeds of cattle will be introduced at the 1960 Smithfield Show. The new classes are intended for the progeny of

Dairy Shorthorns, British Friesians, Ayrshires, Red Polls, South Devons and Welsh females, sired by a bull of recognised beef breed, both sire and dam to be registered with the respective breed societies. There are to be two classes for each breed type. The first is for animals not exceeding 21 months of age, and the second for animals between 21 and 27 months.

Tuberculosis eradication

In view of the importance of the dairy herds' contribution to beef supplies of this country, it is worth recording the progress made in eradicating tuberculosis from cattle in Britain. There are now 9½ million attested cattle, representing some 93% of the total. This compares with approximately 82% a year ago.

Scotland and Wales are now fully attested, and there is every reason to hope that, by the end of 1960 or early 1961, the whole of Great Britain will be an attested area and that bovine tuberculosis will, for all practical purposes, have been conquered.

Twinning experiment

In January, 1959, the Milk Marketing Board's production division commenced field trials in Montgomeryshire, designed to examine the commercial possibilities of a treatment aimed at stimulating cows to produce twins. Cattle, primarily those in beef rearing, were injected—a few days before artificial insemination—with pregnant mare serum (P.M.S.), which has the property of promoting the production and shedding of additional eggs by the ovaries of the cow.

Some years ago, small scale experiments at the Cambridge School of Agriculture demonstrated the possibilities of this technique. Its success does not, however, necessarily mean that it would prove immediately worth while over a wide range of commercial farming conditions.

A number of farmers co-operated in the field trial area and the first twin calves under the scheme were born to a three-year-old Shorthorn cow crossed Hereford bull in October.

Hormone feeding and implantation

Controversy continued to surround the administration of hormones in the final fattening period of cattle and, to a lesser extent, sheep. The plea of the National Federation of Meat Traders for regulations restricting the administration of hormones to livestock and for allowing the technique to be used only under scientifically controlled conditions, was rejected by the Minister of Agriculture on the grounds that "such regulations would probably be cumbersome to operate and difficult to enforce." The Minister, in his reply, also pointed out that the Agricultural Research Council was satisfied that there was no danger to human beings from hormone administration, adding that the question of meat being rendered less attractive by over-dosing with hormone was being studied.

Despite the feeling aroused by their use, various hormones are being more extensively employed than in 1958. Hexoestrol and/or stilboestrol were the two original hormones utilised. A further addition was introduced during the year. The hormone implant known as *Synovex* differs from those already in use, being a combination of two hormones, progesterone and oestradiol benzoate. It is claimed for the new product that, apart from the tendency of the implanted animal to convert feed into meat more quickly, producing more lean and less fat in the process, there is less danger of side-effects and no residual hormone either in the carcase or in the excreta.

Canadian tests of the product gave results of an average extra weight gain of ½ lb. per day and up to 20% more efficient utilisation of feed. Tests on tissues of steers, which had been deliberately overdosed to the extent of ten times the recommended amount, failed to reveal any hormone deposits in kidneys, heart, liver or muscle and only negligible amounts in fat tissue.

Tranquilliser trials for beef cattle

Yet another aid to beef output is in course of trial at the School of Agriculture, Nottingham, under the direction of Dr. G. E. Lamming. Preliminary tests in the use of tranquillisers on beef animals show a 15% increase in growth rate and substantial improvement in food conversion ratio when compared with untreated animals under certain conditions.

The tranquilliser used in the experiment is hydroxyzine. It would appear that the use of tranquilliser is essentially a winter feeding operation, and the treatment would apply particularly to fairly mature beef animals of a year to a year and a half old.

Whilst encouraging results have been obtained, it will be two or three years before definite conclusions can be drawn.

Battery beef

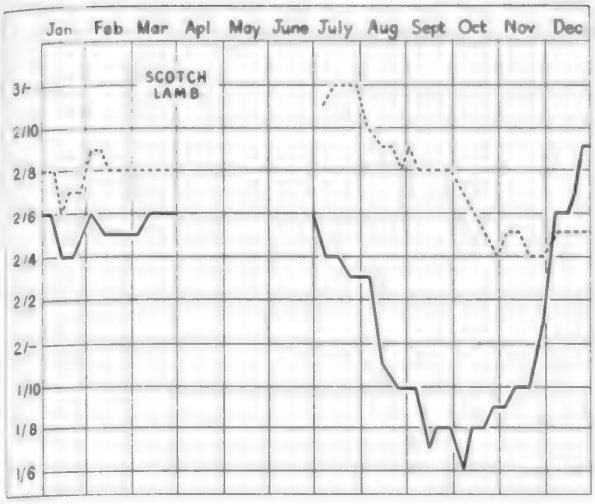
A pilot scheme for "battery" beef production, a method which might well revolutionise beef-raising in Britain, is being undertaken at the Harper Adams Agricultural College, Shropshire.

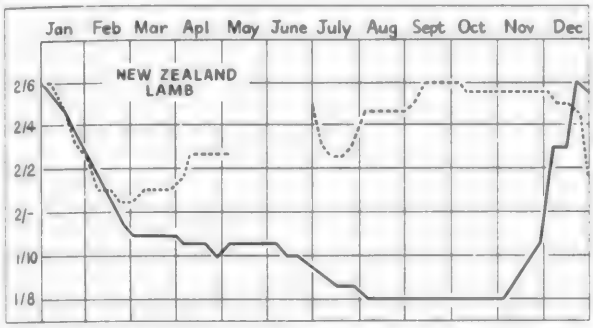
The scheme has been in operation in America for some time where, it is said, units capable of fattening up to 50,000 cattle a year are to be found.

Battery beef is produced intensively under cover and on a scientific basis by the use of batteries of silos with mechanised feeding, supplying a balanced diet of concentrates and silage. By such methods, cattle could be "kept going" all the time and the fluctuations in liveweight gain which occur when cattle go from yards to grazing, and during the grazing period, could be obviated. The desired results of the system are prime quality beef from 8 to 10 cwt. beasts at 18 to 20 months of age, with a lowering in cost of production.

Charollais cattle

In view of the wide divergence of views on the importation of Charollais bulls for experimental pur-





Showing the variation in London wholesale prices during 1959 for (*top*) Scotch lamb and (*bottom*) New Zealand lamb. (*By courtesy of Meat Trades Journal.*)

poses, the Minister of Agriculture has set up an independent committee to examine the matter. The terms of reference are " to examine the proposals that have been made for the import into Great Britain of Charollais cattle and semen, and to advise whether a *prima facie* case exists on animal breeding and husbandry grounds for the Minister to authorise trials with imported Charollais cattle, and if so, whether it would be advisable to hold such trials in view of the possible animal health and other risks attendant on any import."

Many authorities in the meat trade share the view that the Charollais may well have commercial possibilities which would result in quicker maturity from dairy crosses, particularly those from Ayrshire cows, and on such there should be trials with this breed.

The National Cattle Breeders Association, however, strongly object to the importation of these French bulls. The association's opposition stems from the belief that if bulls were imported from a country where foot and mouth disease is endemic, exports of pedigree stock from this country would be prejudiced. Sheep breeders are also perturbed in case such importations should lead to outbreaks of " blue tongue " in British sheep. The breeders say cattle are known carriers of this fatal disease to sheep.

IMPORTED SUPPLIES

Imports of beef have fallen during the last year. Board of Trade returns show that imports of beef fell by nearly 48,000 tons, a 23% reduction on 1958. Arrivals of mutton and lamb, on the other hand, show substantial increases, with a result that the aggregate tonnage of carcase meat imported last year was less than 4% below 1958, when imports were 7% lighter than the previous year.

Total meat supplies from overseas weighed 728,624 tons as against 755,732 tons in 1958. Of this figure beef accounted for 349,694 tons (397,461 tons), mutton and lamb 364,938 tons (339,786 tons) and pork 14,016 tons (18,485 tons). For the first time since decontrol of meat, mutton and lamb imports weighed more than beef. The total of beef comprised 208,800 tons (240,400 tons) of chilled, whilst under the mutton and lamb heading 300,000 tons (280,000 tons) was lamb.

The aggregate of imported offals was 76,000 tons (71,600 tons), poultry 9,000 tons (10,700 tons), and frozen rabbits 9,780 tons (12,170 tons).

Denmark supplied 248,900 tons (221,900 tons) of the bacon total of 347,900 tons (338,000 tons), Poland being the next largest contributor with 48,600 tons (47,800 tons). The Irish Republic sent 18,900 tons (28,800 tons) and the Netherlands 16,200 tons (25,100 tons).

Arrivals of canned meats totalled 175,965 tons (169,000 tons) of which corned beef accounted for 58,300 tons (60,000 tons). In this section Argentina supplies dropped to little more than half, while Brazilian supplies increased from 1,000 tons to 12,000 tons.

The value of deliveries of livestock was approximately £30·5 million of which all but £28,000 worth came from the Irish Republic; the total, however, was nearly £9 million down on 1958.

Argentina

Conflicting reports continue regarding the breeding and meat export supply position of Argentina. The President of the Republic has stated that " the livestock industry is rapidly regaining its former importance and the time is not far distant when Argentina will be in a position substantially to increase meat exports and also to provide reasonable supplies for domestic consumption without depleting the breeding herds."

The newly appointed president of the Argentine National Meat Board has emphasised the importance of the U.K. market, which absorbs 95% of Argentine chilled beef production. The estimated total of 195,000 tons of chilled beef would be shipped to the U.K. during 1959, which should be increased in 1960.

Nevertheless, the total export target—500,000 tons—set by the meat board is unlikely to be achieved, and is regarded by the meat trade as being beyond Argentina's exporting capacity at this time. A maximum figure of 380,000 tons of all classes of meat,

including offal, being a more likely export total.

A factor likely to prevent higher meat exports in the future is the recovery in local demand, after a fall at the beginning of the year following sharp increases in meat prices. Local beef consumption is increasing to such an extent that it is estimated that, within a short time, it may even exceed the high 1958 (213 lb. per capita).

Figures issued by the Argentine National Meat Board show that cattle slaughterings in the first nine months of 1959 in registered meat-packing plants and slaughterhouses totalled 3,151,561—32% less than in the corresponding period of the previous year.

Disease precautions

An additional safeguard to prevent foot and mouth disease being brought into the U.K. from Argentina and other South American countries, was made under the Importation of Carcasses and Animal Products (amendment) order 1959. This order required, as from December 13, 1959, that every consignment of meat and edible offal imported into Great Britain from South American countries be certified by an authorised officer of the Government of the country of origin, as having come from approved slaughtering centres. Frigorificos approved by the M.A.F.F. are already regularly inspected by British veterinary officers stationed in South America.

Australia

An all time record level in volume and value of meat shipments was the highlight of the 1958-1959 Australian season. The value of meat and meat by-products exported was £A110 million, the important items being chilled and frozen beef and veal £A55·6 million (£A21·5 m. 1957-1958), canned meats £A15·5 million (£A15·1), lamb £A8·1 million (£A6·1), and mutton £A5·9 million (£A2·2). The combined value of other meat exports, including pig-meat, was £A7·2 million (£A4·8).

A spectacular rise in frozen beef shipments occurred, increasing to 218,000 tons against 116,000 tons in the previous season. Of this quantity, nearly 52,000 tons had been sold to the U.S.A., compared with a combined total of 7,000 tons in the previous three year period. Meat sales earned approximately $50 million.

During the year, Mr. John Hare, British Minister of Agriculture, visited Australia and New Zealand. At the conclusion of his Australian tour he exhorted the Australian meat industry to build up their exports of chilled beef, commenting that Argentina was unlikely to expand output in the foreseeable future, and Australia should capture and hold the British chilled beef market. At present Australia was not taking full advantage of the potential market in Britain for chilled beef, shipping to Britain only about one-third of the quantity of chilled beef exported before the Second World War. Last year 95% of beef from Australia had been frozen.

Livestock census figures, however, show that the beef cattle population had fallen from 12 million to 11½ million during the year, whilst the sheep population rose substantially to 153 million, more than three million above the previous year's figure.

Port improvements

Work worth millions of pounds has been either completed or is well under way to completion in one of the most concerted port improvement drives in Queensland's history. The harbour at Bowen is being deepened to enable larger ships to be utilised, wharf extensions are in hand at Gladstone, Central Queensland, whilst at Port Alma the reclamation of 200 acres of land is planned and a wharf is to be built, specially designed to facilitate the loading of meat cargoes. In the capital, Brisbane, a general programme to improve port depth is well in hand.

Shipment of live lambs

Shipment of 30,000 lambs, the first of proposed shipments of 200,000 lambs per year, were made from Sydney to San Diego, California. The lambs were subjected to examination before, during and after loading, veterinary officers accompanied the lambs, which were fed on a specially formulated diet on ship. For a short period after landing, the lambs were placed in quarantine, and then slaughtered.

New system of carcase evaluation

A new system of judging chilled carcases of beef was recently instituted to assist the Australian cattle industry to reach consistent standards in producing beef for export.

Judging is based on a set of measurements on various sections of the quartered carcase, thus providing ideal and precise standards by reducing eye judgments to the minimum. Points are awarded for the following qualities: fullness of meat (eye muscle depth and length), fat cover (thickness over eye muscle), balance of carcase (ratio of forequarter to hindquarter) and weight suitability.

These measurements are supplemented by certain eye judgments to assess the carcase for evenness of fat distribution, colour and texture of muscle and fat, and the degree of "marbling" of the muscle.

New Zealand

The 1959 New Zealand season (October-September) has been remarkable from the meat export view, a new record being established at 443,632 tons. Of the total, 326,576 tons were shipped to the U.K. Principal items in the increased output were mutton and lamb. Production of beef and veal showed a slight decline. Shipments of 1958-1959 season's New Zealand meat to markets outside the U.K., in the period, totalled 24·4% compared with 27·8% for the previous season.

A record kill of 17,366,708 lambs was achieved; the earlier months of the season's lamb slaughter was greater than the last, due to dry conditions in the major producing areas. This early killing brought down average lamb carcase weights by about 1¾ lb., thus giving less tonnage than would otherwise have

come forward. Nevertheless, the new season's lamb produced for export in the early part of the season amounted to 61,000 tons compared with 56,000 tons for a similar period last season.

The sheep population of New Zealand now exceeds 46 million head—an increase of 3¾ million on the previous year, and of these it is estimated that 31 million are lamb. Over the last five years the lamb total has increased by about 8 million and ewes 7 million.

Record lambing season

The season showed a record number of lambs born, high lambing percentages being obtained, the best being Southland with 112·14%, Otago 106·12%, Canterbury 105·5% and Westland 102·11%. The average in the North Island was 93·7%. In view of these record figures, some concern has been expressed that fat-lamb production is expanding more rapidly than markets—particularly those outside the U.K.—can be developed.

New Zealand beef production

Many authorities, including Mr. John Hare, have spoken of the need for New Zealand to expand beef production, particularly that for the chilled beef trade. There was an improved tonnage, 5,922 tons, shipped to the U.K. during the year, compared with 397 tons the year before, but even so the expanding chilled beef market could be further developed.

A report had shown that New Zealand dairy farmers had held back 100,000 calves for beef rearing. A proportion of the number might be held for herd replacements, but opinion in the industry believes the figures indicate a significant move towards cashing in on the richer fields of beef production for overseas markets.

U.S.A. and manufacturing beef

American demand is chiefly for imports of lean manufacturing meat—particularly boneless—to be used for hamburgers and other meat products. In consequence of this demand, poorer quality lean meat has been obtaining better prices when shipped to the U.S.A. than has higher quality meat shipped to the U.K. Some concern has been expressed at the increased proportion of cows in the total of animals slaughtered for this profitable export meat, many fearing that breeding stocks may suffer. New Zealand livestock estimates indicate, however, that sufficient heifers have been held to maintain the beef-rearing herd.

New freezing works

The new freezing works, being built for the Alliance Freezing Co., Lorneville, is due to be ready for the 1959-1960 season. It will be capable of an annual throughput of 1 million sheep and/or lambs, and a daily throughput of 200 head of cattle. This major work has been made necessary to meet the increasing Southland exports of frozen meats which portends to make Bluff the chief meat port of the country in near future years. Over recent years the Southland province sheep population has increased by over 1 million.

TECHNICAL ADVANCES

Convincing proof of the constantly growing influence of technical education in the meat trade was given by a further large increase in the number of entries for the Institute of Meat examinations. The 1959 figures exceeded those of 1958 by 35%. This record figure was due to a large extent to expanded classes in the established centres and also from centres submitting entries for the first time. Increased numbers, both in centres and students, is undoubtedly influenced by the Institute's apprenticeship scheme. The year 1959 saw the holding of regional heats for the first "Apprenticeship of the Year" competition, the finals to be held in April, 1960.

Examination results show that the percentage of passes had not varied greatly from those of previous years. There was, however, a better standard in the practical examinations through the appointment of Regional Assessors.

Irradiation preservation

A setback for the preservation of meats and other foods by atomic radiation comes with the announcement that there is little chance that the problems associated with radiation-sterilisation will be solved in the near future. The U.S. Army, who have been greatly interested in the technique, recently suspended work on the large scale irradiation plant it was building to sterilise hundreds of tons of food per week, after spending millions of dollars on research and development.

The principle of radiation-sterilisation is simple, the food being given a dose of radiation sufficient to destroy the bacteria which would cause it to decay. Unfortunately, some of the most dangerous micro-organisms have been found to be the most resistant, making it necessary to give heavy doses of radiation to ensure a safe level of sterilisation. These heavy doses have affected the wholesomeness of foods, colour, odour and flavour being changed to a detectable degree. Moreover these changes have become worse when foods have been stored.

Radiation has also been found to produce chemical substances—particularly in fats—which could produce biological effects in animals eating them similar to those produced by direct radiation.

New sausage and small-goods machines

Experience over more recent years has shown that the future fresh sausage trade, now estimated to be in the region of £90 million per annum, can only be assured and increased by production in the most efficient, and therefore most economical, manner, and these can only be achieved by full use of modern machinery and techniques. To cater for the immense demand for sausage and other prepared products, new machinery has become available and, in-

cluded among the many such machines recently announced are:

1. Heavy duty rotor chopper

This completely modern heavy duty rotor chopper has a knife speed of up to 4,400 revs. per minute, although it can also be operated at the more normal speed of 2,000 r.p.m. There is little, if any, heating of the mixes so ensuring a longer life for the products Rinds and gristles may be pulverised, and, in the process, absorb large quantities of water. Hard frozen meat and ice blocks can also be chopped in this machine.

2. Continuous vacuum filler

This multi-purpose machine will undoubtedly prove a useful addition to many sausage factories, and is capable of filling various shaped cans with all types of products, with weights ranging from ¼ oz. up to 10 lb. The filler operates under vacuum and is continuous, a large hopper merely needing to be filled. The machine may also be used for filling casings, both natural and artificial, and with an attachment fitted, automatic linking is possible at speeds of up to 200 sausages per minute, claimed to be the fastest in the world. Thus 25 lb. of sausages, exactly produced at eight to the pound, are delivered each minute of production.

3. Automatic sausage drier

A fully automatic sausage-drier has been designed to dry the moisture on the outside of sausage casings in 1½ minutes for hog casings and 1 minute for sheep casings. The machine operates on a continuous basis, sausages being hung in a revolving cage which can be set to the requisite time to dry either hog or sheep casings in one revolution. It is possible to dry 24 lb. sausages each minute.

New meat vessels

Ship owners, ever mindful of the requirements of the imported meat trade, announced new constructions, launching and maiden sailings of refrigerated vessels.

The Blue Star Line's *Ulster Star* sailed on her maiden voyage to La Plata, and among her features is accommodation for six passengers. She has been specially designed for the London-Buenos Aires chilled meat service, her six holds being refrigerated. One of the most modern ships of her kind in the world, she was built at a cost of about £2½ million and has space for 3,000 tons of chilled beef. The same line also launched a refrigerated cargo ship that is intended to cover the Southern Hemisphere.

Four new ships, specially designed for the refrigerated cargo trade between Australia and North America will shortly enter service for the Crusader Shipping Line, which was formed last year to service the growing meat export trade from Australia and New Zealand to the West Coast of the U.S.A. and Canada.

Meanwhile, having travelled by the newly opened fast "north-about" route over the north of Australia, the *Queensland Star* arrived in London carrying 7,000 quarters of chilled beef from Australia, delivering this beef to Britain within 35 days of the slaughtering at the processing works in Queensland.

Ultra-modern meat market

Smithfield House, the new ultra-modern meat market in Luton, was designed with two objects in view —the minimum handling of meat and the maximum of hygiene in every section.

The meat is taken from the abattoir and placed on a hook, which it does not leave until delivered to the butcher's shop. In the meantime it has been automatically weighed, coded, numbered and dated, displayed and bought.

Ultra-modern both in conception and design, Smithfield House is a two storey building, constructed of reinforced concrete. The ground floor accommodates the refrigerated sales hall, loading bays, freezer, cutting rooms, display room, control office and buyers' reception office. The loading bays, being 80 ft. in length, provide space for six large vehicles, four being positioned for goods out and two for goods in. At each extremity of the loading bay are the central offices from which all movement is controlled.

Who Owns Whom

In recent years the practice of grouping a number of companies under single ownership has become much more widespread. These two volumes* form a guide to parent companies and their subsidiaries.

Volume I, which has added another 3,000 companies to those given in the first edition, lists the subsidiary companies alphabetically and indicates their parent concerns. A letter reference indicates the principal activity of the parent firm; when it has proved impossible to determine the main interest an appendix supplies information as to their activities.

In volume II (of which there has been no previous edition), the parent companies are listed alphabetically with their subsidiaries and sub-subsidiaries beneath them, indented and in smaller type. It is thus very easy to see at a glance the extent of a company's interests insofar as this is reflected by the companies it owns.

Both volumes are easy to follow, and cover their subject thoroughly and concisely, but they are, of course, limited to public companies, and the subsidiaries and associates of public companies, in industry and commerce.

* A Directory of Parent and Subsidiary Companies in Industry and Commerce, 1959. O. W. Roskill and Co. (Reports), Ltd., 14, Great College Street, London, S.W.1. Two vols. £6 6s. net.

WORLD FOOD SUPPLIES—4

Standards of Nutrition – I

By Francis Aylward,* Ph.D., D.Sc., F.R.I.C.

The fourth in this series of articles shows that many long-held beliefs concerning dietary requirements are open to question; recent investigations indicate that many accepted "standards" are wide of the mark, and newer knowledge of inter-relationships between nutrients makes nutrition a more complicated subject than it was once thought to be. The previous articles dealt with Sources of Food (February and March) and Choice of Foods (April).

THE nutritionist who is concerned with quantitative aspects of diets aims at assessing first the minimum daily energy requirements of the body and secondly the minimum daily requirements of proteins, minerals, vitamins and other accessory factors to meet needs for essential nutrients. He is concerned first with *adequate* nutrition and secondly with *optimum* nutrition, recognising that a particular diet may enable a man to exist, but a better diet may enable him to flourish.

REQUIREMENTS OF THE INDIVIDUAL

Our knowledge of nutritional requirements comes partly from investigations on individuals—men, women or children—and partly from surveys carried out on small groups, on communities or on large populations. The methods used are summarised by H. E. Magee[5] in his recent monograph *Nutrition and Public Health*, and are described in greater detail in various reviews[2, 7] and official reports, one of the most useful of which is that published by the National Research Council of the U.S.A. under the title *Nutrition Surveys: their Techniques and Value*.[24]

Some of the special difficulties encountered in obtaining accurate information will be discussed later under appropriate headings, but at this stage reference must be made to a basic problem in many types of survey, namely that of obtaining correct estimates of the food *actually eaten* by individuals (as distinct from *total* foods *bought* by a family). There are often errors arising from waste in the kitchen or on the table as well as losses of nutrients during storage and cooking.[11] In some investigations special methods have been used to reduce these errors to a minimum (cf. recent reports on army cadets).[38]

Population increase in Tunisia has resulted in 100,000 people crowding its slums. At the request of the Tunisian Government, survey teams led by F.A.O. experts have been investigating the health, nutrition, economic and social problems of the slum dwellers to find out the best ways of helping and settling the population, such as by direct help in the form of milk and cod liver oil distribution, and by nutrition education. The government school lunch programme is also being expanded. This picture shows a family in a Tunis suburb being interviewed by a survey team; the caged chickens and rabbits which provide a source of protein food show the family to be enterprising.

1. Calorie requirements

Many textbooks on nutrition present a simplified account of the daily food requirements of man based on the energy that is expended by people under different sets of conditions (such as rest,

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light work, heavy work). The accepted tables and formulæ, although useful for many purposes, may obscure the difficulties in obtaining accurate estimates for individuals[8] and also for communities living and working under widely diverse climatic conditions and making use of many different types of foods.[3, 6, 10, 13, 15]

Apart from the problem of estimating the foods eaten, errors in calculations can arise from three different sources:[18, 40, 44, 59]

(i) methods of food analysis and calculations from these analyses of the food utilised by the body;

(ii) lack of precise knowledge of the digestibility of many foodstuffs especially in mixed diets;

(iii) lack of knowledge of the effect of factors influencing energy expenditure and food intake from one individual to another and under different environmental conditions (more especially temperature and humidity).

The errors from (i), (ii) and (iii) do not necessarily operate in the same direction; their effects may vary in magnitude depending on the diet and on environmental conditions.

The extent of individual variations even in a relatively homogeneous group is shown by the reports of British workers on children and also on army cadets. Thus in one study Widdowson found that in groups of children of the same age (and sex), one child in twenty ate almost twice as much as another in the same category.[59] Edholm and his colleagues found that with cadets living and working under the same conditions there were differences in requirements of 1,000 calories a day (the figures normally quoted for total requirements are of the order of 3,000 calories per day, so that the differences may be 30% or more.)[37]

Evidence is accumulating from these and other workers which points to the conclusion that different individuals can carry out activities with less expenditure of energy, and thus by "conserving" energy live on less food (and yet maintain their weight).[32, 33, 38, 50, 58]

The F.A.O. report on calorie requirements (1950 and 1957) defines the physiological needs in terms of a "reference man" (and a corresponding woman); the report emphasises that the "recommendations are provisional and tentative" and that "many of the problems . . . cannot at present be fully and satisfactorily answered." It also states that "quantitative studies on the influence of climate, clothing and shelter on total energy metabolism are insufficient to allow any precise conclusions to be drawn."[20]

Typical of the newer investigations are those carried out in Uganda by Schwartz and Dean[52] who examined boys in a residential school. They found that with all the diets used the boys ate considerably less than British boys of the same age and that even with a diet which was obviously popular and which was available without limit, the food intakes were below 90% of that found in the U.K.; nevertheless "there were no clinical signs of undernutrition in the children who took part in the investigation or in any other children in the school" which was under constant supervision for over three years.

Clearly, many more investigations should be carried out on both adults and children in Uganda and other tropical regions; but the results given above suggest that caution should be exercised before conclusions are drawn that groups of people are suffering from malnutrition solely because their food intake is less than the average in the U.K. or the U.S.A.

Nutrients

Class	*Individual*	*No. required by man*
Protein	"Essential" Amino Acids	8+
Fats	Essential Fatty Acids	1+
Vitamins	Individual Vitamins	12+
"Minerals"	*Major elements such as Ca, Fe, I Minor—trace elements	15+

* Both the "major" and "minor" elements may be required for incorporation into organic compounds such as vitamins, hormones or enzymes.

2. *Amino acids and proteins*

As already noted, one of the characteristic trends in food habits has been towards the increased consumption of animal foods. Up to recent times this change involving the replacement of vegetable protein by animal protein was accepted as eminently desirable.

It has long been recognised that one of the primary purposes of food protein is to provide for the formation and re-formation of body tissues; the food proteins are broken down to amino-acid units and these are then reassembled by the body to give tissue proteins.

Protein quality

Proteins differ in their content of amino-acid units and in their *biological values*, that is, in their efficiency in providing body protein, and it can thus be argued that the body proteins themselves would be highly efficient as food. Although cannibalism can scarcely be recommended on these grounds, there is general agreement that meat proteins from domesticated or wild animals are to be regarded as "high quality" or "complete" or "first-class" proteins in human nutrition, and milk protein is placed in the same category.[2, 12, 21]

Several *purified* vegetable proteins have been found to be "incomplete," *i.e.* deficient in certain of the amino-acid units, and on the basis of early experiments many writers dismissed *all* vegetable proteins as "second-class."

Thus the League of Nations "Mixed Committee" on Nutrition (which published extremely valuable reports in the 1930's) noted (1937[17] p. 60) the function of proteins in building new tissues for the growing animal and in repairing tissue wastage, and stated: "For these purposes, the proteins contained in animal foods are of better *quality* than those contained in foods of plant origin, the pro-

A little African child sufferer from kwashiorkor, the regional name for protein malnutrition, symptoms of which are uncurled greying hair, oedema and skin lesions. The condition is common in areas where diets are high in starchy foods and low in protein, and can be cured by protein-rich foods or by skim milk. (*All the photos in this series of articles are by courtesy of F.A.O., Rome.*)

teins of milk, eggs and glandular animal tissues (liver, kidney) being specially valuable. Foodstuffs rich in animal protein have sometimes been called body building foods. The diet should contain a certain proportion of foods containing 'good' protein, and it is usually held that about 50% of the protein in a diet should be of animal origin."

An earlier report[16] of the Technical Commission on the Physiological Bases of Nutrition stated: "The protein should be derived from a variety of sources, and it is desirable that a part of the protein should be of animal origin. During growth, pregnancy and lactation, some animal protein is essential, and in the growing period it should form a large proportion of the total protein."

Recent investigations have thrown doubt on this over-simplified picture in that it has been shown that:

(i) the *total* proteins from a plant source such as whole wheat or wheat germ or soya are often of high quality, even though a *purified single* protein from (for example) wheat, may be of lower quality;[1, 5, 53, 54, 55]

(ii) the proteins of micro-organisms such as yeast may also be of relatively high quality;[31, 43]

(iii) a plant food supplemented by a *relatively small percentage* of animal protein, may be biologically quite as adequate as animal protein alone;[22]

(iv) a mixture of plant foods (*e.g.* cereals and soya bean) may supply a mixture of proteins of good biological value;[31]

(v) the biological value of a plant protein may be increased under certain circumstances by supplementation with individual amino-acids;[31, 39, 41]

(vi) some of the special benefits ascribed to animal (as distinct from plant) proteins may well be due not to the protein itself but rather to supplementary factors (such as Vitamin B_{12}) which may be associated with the protein (but which can be supplied from other sources).[9, 21]

Protein quantity

Other investigations have demonstrated that the earlier figures proposed for the total *quantity* of protein required are almost certainly too high and that the daily amounts actually needed by the normal adult are considerably less than those which have been accepted by many authors of textbooks and reports.[31, 34, 52, 56]

The authors of the F.A.O. Report[19] on Protein Requirements (1957) recognise the difficulties and note: "The provisional nature of this report must be emphasised. Its quantitative recommendations are throughout tentative. The Committee felt, however, that in dealing with a problem of such practical importance, it is necessary to make use of such knowledge as exists, even if this is incomplete and needs extension at many points by further research. It deplores a tendency sometimes met to extract some particular figure or figures from reports on dietary requirements or "recommended allowances," and to assign to these a precision which the text of the report does not justify. The Committee has tried to counteract this tendency by using careful and guarded phraseology, by hedging its recommendations with the necessary qualifications, and by insisting on the need for further research."

Many reports have appeared in recent years on kwashiorkor and related conditions which are well known in tropical regions and which are thought to be due to the low level of protein in the diet; the term "protein malnutrition" has been coined to cover various interrelated clinical conditions. A recent symposium[21] in the West Indies brought together many of the leading workers in this field and the report shows the complexity of the problem and the difficulties in both diagnosis and treatment.

Although it is evident that diseases are associated with low protein diets, it is still not clear whether specific amino-acid deficiencies are involved or other factors normally present in animal protein foods or whether some "imbalance" of dietary components is the cause. (These and other types of clinical and laboratory

investigations have indicated the importance of a distinction between *proteins* considered as amino-acid combinations and *protein foods* in which other nutrients, such as water soluble vitamins, may be associated with the protein).[21]

Actual requirements

The extent and distribution of "protein malnutrition" is not at all clear from published reports and it must be noted that many investigators have drawn attention to the apparent absence of malnutrition in communities living on low protein diets. Thus Mirone[47] showed that adults could be physically active on diets containing less than 60 g. of protein daily and that their blood chemistry appears normal. Schwartz and Dean[52] in their Uganda survey noted that the schoolboys examined, when provided with an unlimited amount of food, consumed less than comparable British school children; the protein intake was less than 60 g. per day. In the whole series of experiments at the school the highest figure for animal protein was 15 g. daily.

The authors point out that in spite of these low intakes there was no evidence of under-nourishment among the children examined nor indeed in the school as a whole or in other similar schools in Uganda. They add "it is impossible to say whether the addition of protein to the African diet would be an advantage; that is another matter for speculation until it has been settled by the long overdue experiment. Nothing is known about the absorption and utilisation of protein in these children." They believe that "there is no known necessity for a high proportion of animal protein in a diet that has enough total protein" and conclude "it must be emphasised that until it has been shown definitely in controlled feeding trials that dietary supplements are advantageous, any scheme for increasing or improving the diet will be without scientific foundation or justification."

(To be continued)

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This list is confined largely to publications which themselves contain detailed references to sources.

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(Concluded on page 213)

Pear Canning in Britain can Pay Off

By L. B. Scott

In the face of keen competition from Australia, S. Africa and California, British canners cannot afford not to invest capital in proper equipment and to pay more attention to ripening and grading, says the author.

LEST any reader think the use of the word "Britain" as opposed to "England," be in the nature of hair-splitting, the author hastens to point out that pears have been canned commercially in each of the four countries of the U.K.

This may seem odd, for we can hardly claim to be a dessert pear growing country; apart from the Conference variety, hardly any of the other types are worth canning. What, then, is the origin of this section of the canning industry?

Early days

A few years ago, when imported fruit was in short supply, several of our canners turned to the processing of imported "exotic" fresh fruit as a fill-in during the time when their plants would otherwise have been idle. This enabled the canners to keep their costs down, and at the same time, gave the fruit-starved housewife greater variety than she had known for a long time. Alas, however, the wheel has turned a full circle, and once more the imported supplies have largely replaced the home produced packs on the grocers' shelves, and apart from fruit salad, very few British packs of "exotic" fruit are now seen, and the outlook for the future may be even worse.

Gaining experience

The amount of "know-how" in pear canning was very limited, and most of the canners gained their experience the hard way, with trial and error the basis of their knowledge. The author knows of canners having supplies of green, hard pears lying in their premises during February and March, when snow lay on the ground, and air temperatures were around 40°F. Yet they did not know what to do to ripen the fruit.

Had it not been that the demand was good, and selling prices high, the cost of the packs would have been sufficient to deter further attempts.

Losses were relatively high during such periods, but those who kept going were rewarded for their persistence, and good profits were achieved for quite a time. As was pointed out earlier, knowledge was gained the hard way, but not enough attention was paid to the future when competition was bound to develop.

Now that competition is here, the industry found itself out on a limb, and it has a long way to go, with much capital investment to make, before it can compete on level terms with packs imported from abroad, particularly Australia, South Africa, and California.

Problem

All this poses the question: would it be worth while for the industry to make such investment as would be necessary? The answer to that is simply that it cannot afford *not to!*

Take a census of all canneries which have produced pear packs in this country, and how many of them have equipped themselves with modern pear equipment during the past five years? The answer would not be more than 1%, so how could it meet competition?

The author has no knowledge of South African wage standards, but has of Australian and Californian, both of which are very much higher than British. How is it, then, that they can deliver into this country, packs of pears, and other fruits, cheaper than can be produced here? The answer is self-evident—mechanisation.

Before committing himself to an investment of several thousands, the wise canner will wish to know if the expense can be justified on the grounds of sales potential, throughput, and continuity of supplies.

Sales potential

Of all fruit put up in cans, Bartlett pears are probably the best seller. With so many brands on the market today, there can be no doubt but that to win a share of public esteem, a home produced pack must be equal to, if not better than, the imported brands. Given attention to quality, there is a definite market for canned pears, and this market is not confined to Britain alone, as a market also exists in Europe, so that from a sales point of view, there is plenty of encouragement, especially if the price be right.

Supplies and throughput

These two angles are related, and if the supply position be noted, the throughput is a matter for individual decision.

Dealing with imported fresh Bartlett pears only, supplies are available during January and February from the Argentine, March to May from South Africa and Australia, and August to September from Italy. This gives a longer potential throughput period than any enjoyed by the producers in the countries mentioned earlier.

From the above, it will be seen there can be no valid reason why British canners should not compete, but a comparison of methods will show why it is imperative for the industry to be modern in concept and equipment.

British methods

The preparation of pears for canning in this country is a relatively slow process, involving a

lot of hand labour. Most used method for removing the skin is by first immersing the pears in a hot dilute brine solution to expand the skin. This is followed by a cold water bath, and the removal of the skin is completed by slipping it off by hand, or by putting the pears through a washing machine, similar to a carborundum peeler. Of course, in this machine the carborundum is removed in order to avoid bruising the fruit.

To peel pears by this method, it is essential for the fruit to be at the correct stage of ripeness, and more arguments have been caused by determining this than by any other operation.

At the right stage of ripeness the skin should slip off easily, but, with any trace of firmness the greater is the resistance, or, if over-ripe, the flesh becomes mushy, so a few words on ripening may not be amiss.

Ripe pear determination

The method of using slight thumb pressure on the stem end of the pear may be all right for the housewife, but as a test for volume production it is useless.

Neither can colour be an accurate guide, and the author has seen many pears which were fully coloured, but were too hard to handle, whilst on the other hand he has seen green pears fully ripe!

The only accurate guide is the use of the "pressure tester" at all stages, from picking firmness to cold storage entrance, and from entry into the ripening room to time of delivery at the peeling lines. Nothing can spoil a pack of pears more than being canned too hard. What is "hard" to one man, is "firm" to another, so far too much is at stake to depend on individual opinion.

The correct procedure for ripening pears is well worth studying by any canner who wishes to put up a first grade pack.

Further operations

Following the removal of the skin, the pears are cut in two halves, sometimes by machine, but more often by knife operators. One of the faults of the manual method is that the pears are not cut straight, which makes the removal of the cores and stems more difficult and unsightly, and also in many cases leaves the calyx. It cannot be said this is always the case, but it does happen very often, and certainly is not the best method to produce a good quality pack.

From the above it will be seen that much manual operation is involved, leading to high labour costs and low rate of production.

Machine comparison

Compare all these hand operations against the cost of a machine which will peel, core and stem, and remove calyx, at a rate of 48 pears per minute, using one female operator, with possibly two or three examiners correcting any faults. The efficiency of this machine is very high, the labour cost so very much less, and, above all, the finished article looks so much better, that there can be no doubt our methods are so obsolete we cannot hope to compete with the imported packs unless we, too, modernise.

Facilities

It may be argued that the British canner has not got the cold stores nor ripening facilities of his counterpart in California or Australia, but even in this country it is possible to have pears stored, ripened and delivered for a small additional charge, without going to the expense of building such facilities. As a matter of fact, some canners have availed themselves of these facilities, so this argument cannot apply.

Home-grown fruit

The "Conference" pear has already been mentioned as a possibility for canning, but from a quality point of view, it is not up to the standard of a Bartlett. In any case, the home grower does not seem to pay much attention to canning quality. The author has seen pears in canneries and in Covent Garden which should never have left the orchard. Bruised, blemished and scab infested fruit will never appeal from a quality angle, and if one adds to this the presence of mis-shapen and badly graded fruit, it is little wonder there is a preference for imported pears.

Severer quality grading needed

There is, and will continue to be, a decided market for canned pears, and in view of the vast difference in labour costs between our methods and those in competing countries, there is no alternative to falling in line with the modern methods.

The home canner could, with the proper equipment, produce an article equal to the best in the world, by paying proper attention to his ripening methods and adopting a more severe quality grading in the finished article.

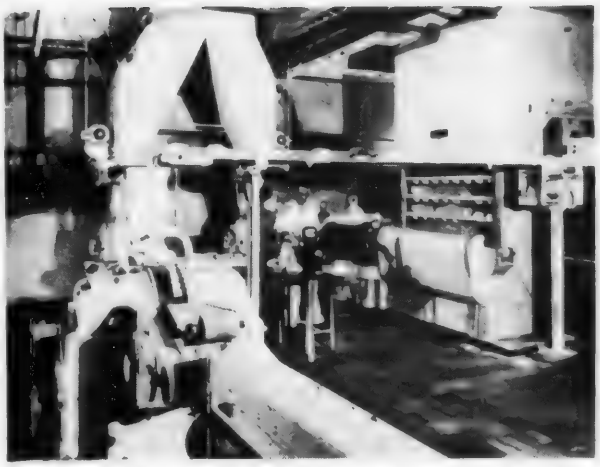
The housewife of today is much more critical than she was five years ago, and if she finds quality at a reasonable price, she would support any canner from her own country who is really trying to please her.

The Mushroom Revolution

THE changes which have transformed the mushroom industry during the decade after the war have provided the inspiration for a historical commentary* which at the same time throws a light on the problems which face the industry. The author is well versed in the subject for in addition to holding various posts within the industry, he was a founder member of the Mushroom Growers' Association of Great Britain and has held every possible post in that organisation at some time or other. He is also chairman of Noble Mushrooms, Ltd.

This unique experience which the author has is revealed in the chatty and informal way in which information and advice are given which makes both for enjoyment and easy assimilation of knowledge. There are eight half-tone illustrations.

* *This Mushroom Business.* By Fred C. Atkins. Faber and Faber, London, 1959. Pp. 107. 18s. net.



(*Left*): **Part of the breadmaking line where dough pieces are formed.** (*Right*): **This " Turboradiant " oven has a capacity of 1,700 loaves an hour and can bake different kinds of bread.**

Scotland's Newest Bakery Opened

Bulk handling in Milanda's £1¼ million plant

THE most modern comprehensive bakery in Scotland, built by the Milanda Bread Co., Ltd., at a cost of more than a quarter of a million pounds, was officially opened on March 22 by Sir Ian Johnson-Gilbert, the Lord Provost of Edinburgh.

This factory, the most recent addition to the Sighthill Industrial Estate at Edinburgh, is a functional and compact building with an area of 60,000 sq. ft., which provides spacious accommodation for all the manufacturing, administrative and transport departments.

Dough preparation

The Milanda Bakery claims to be among the first in Great Britain to be fitted with bulk handling and storage for flour supplies. Flour is pneumatically forced from bulk transporters, carrying 14 tons of flour each, up to the four steel storage silos in the bakery tower (total capacity 120 tons), and from there is tapped when required, and filtered in the process, to an automatic weighing machine in the adjacent dough room. All the processes involved, from the storage silos to the vehicle maintenance bay at the other end of the building, are laid out to give a one-way flow. In the dough room, where the temperature is controlled in order to maintain the right degree of humidity, measured quantities of flour are fed into a mixing bowl mounted on castors, which enable the bowl to be run on to one of the two mixing machines. Between the two machines is an automatic dispenser which adds the remaining ingredients, and the mixture is then covered by a closely fitting metal hood and kneaded by a mechanical arm to give a uniform content and texture throughout the dough. The dough is then allowed to ferment for approximately four hours.

After fermentation has taken place, an electrically operated tilting mechanism tips the bowl and dispenses the dough into a wide chute which carries it into the baking hall on the ground floor below. The chute is forked, so that dough is fed into twin dividers and separated into pieces of equal volume and weight. From here, the pieces are carried by conveyor belt to be moulded into shape against the side of a revolving cone, and are then tipped, eight at a time, into

trays of cloth "cups" which carry them slowly through the gently heated chamber of a "first prover." In the course of this 20-minute passage through the prover, the lightness of texture lost in the shaping process is restored by fermentation.

Baking

Two alternative processes are now available, according to the type of bread to be baked. One conveyor line supplies dough pieces to a spindle moulder which reshapes them for baking as tinned or pan bread. They are then passed into a final prover, through which they move slowly for about 40 to 50 minutes before being placed, in individual tins, into the oven mouth. The second conveyor carries dough pieces to a point where they are placed in trays which take two rows of 29 loaves at a time, for producing batch or plain bread which has no side crust, and from which they are also passed through a final prover.

Baker Perkins, Ltd., who supplied most of the machinery used in the bakery, have installed the one oven—known as a *Turboradiant*—which does all the bread baking. The oven has a maximum capacity of just over 1,700 loaves an hour, and its heat is evenly circulated by means of a fan. Bread passes slowly through the oven, and the loaves emerge on to a platform of rods which allows them to cool sufficiently for them to be handled. Workers then turn them out of their tins and stack them on trolley racks. Fully laden trolley racks are wheeled into a 60 ft. long cooling chamber, through which they take an average of three hours to pass, and emerge ready for slicing and wrapping on automatic machines.

Confectionery

The confectionery division occupies one-half of the main bakery hall and produces a wide range of goods, from morning rolls to iced cakes. Most of the confectionery baking is done in a long, double-decked travelling oven, but there is also a small oven used for baking slab cakes, and there are hot plates for baking scones and pancakes.

The parallel layout of the bread and confectionery plants has been designed to simplify loading and despatch. This is done from a vehicle hall which adjoins the baking hall and is separated from it by a partition wall. Vans are subjected to high-pressure water jets before entering the hall, and are brushed down to ensure that all dust is removed. Care has been taken in the design of the bakery interior to ensure that cleaning and maintenance can be carried out as easily as possible. A special high gloss paint has been used which will not become pitted or heavily scratched to allow dust to be trapped on walls or ledge surfaces, and grease- and water-resistant tiles have been laid on the bakery floor.

Italy's Cheeses are gaining Popularity

ITALIAN cheese is in demand the world over, and the enticing array of varieties is steadily being increased by highly modern and well-equipped plants operating in conjunction with modern farming methods. It is estimated that there are some 17,200 firms engaged in cheese production in the country.

The industry obtains the necessary milk through the state-controlled milk depots. The annual milk yield averages some 82 million hectolitres and is produced by some 3,300,000 head of dairy cattle, 6,500,000 sheep and 1,600,000 goats.

About half the total milk yield is absorbed by the industry and a small percentage by small-scale manufacturers. Of the remainder, some 17 million hectolitres are used for rearing calves and some 24 million sold to the public.

The total national production of cheese, 412,000 metric tons, is composed of the following main types:

	metric tons
Parmesan	100,000
Aisago	12,000
Sbrinz and Emmenthal	11,000
Fontina (soft cheese)	8,000
Montasio	16,000
Provolone	25,000
Gorgonzola	45,000
Italico, Quartiloco	65,000
Pecorino (Sardinian)	6,600
Pecorino (Roman)	820
Pecorino (other)	29,700
other fresh cheeses	18,000
goat cheeses	3,500

In addition, small quantities of local cheese types are made, particularly in southern and Alpine districts.

The best known amongst the hard cheeses abroad and major export items are Parmesan and Provolone. Amongst the soft cheeses the most popular is the famous Gorgonzola.

Before the war, annual consumption of cheese per head amounted to 4·8 kg., but this figure increased to 6·99 kg. in 1953 and to over 8 kg. in 1958. The entire national production remaining after exports, amounting to 17,000 metric tons in 1953 and to over 24,000 in 1958, was so inadequate for home requirements that, on average, 23,000 metric tons of foreign cheese was imported, mostly from Switzerland (Gruyere and Emmenthaler) and Holland (Gouda and Edam).

In addition to the above figures, there has been a marked rise in the production of cream cheese, with over 15,000 metric tons, as well as cheeses obtained from sheep's and goat's milk.

One of Italy's best customers is the U.S.A., chiefly for Pecorino, Parmesan and Provolone, followed by France and the United Kingdom as major consumers of both Provolone and Pecorino Caciocava. Soft cheeses, such as Gorgonzola, Fontina and Stracchino, are exported to France, Norway, Switzerland and the U.S.A.

A dark side to the picture is the fact that Switzerland continues to import grating cheese from Argentina, although the Italian product is superior in quality, and that Great Britain imports blue cheeses from Denmark rather than Italian Gorgonzola.—JOHN ASHTON.

Packaging

(*Left*): **These 6 oz. heat-sealed packs are wrapped in " Lustrawax," a high gloss waxed paper supplied and printed by the Robinson Waxed Paper Co., Ltd.** (*Right*): **This fishcake carton is made of 0·016 in. white lined Manila board with tuck-in ends and lock slits on bends. Maker is Pearlite Box Co., Ltd.**

Bread pack

A new slimming food, *Primula Slimbread*, made from fine-ground rye in thin crisp slices, is being marketed in a 6-oz. pack wrapped in *Lustrawax*, a high-gloss scuff-resistant waxed paper, supplied and printed by the Robinson Waxed Paper Co., Ltd.

The wrappers are of 15-lb. opaque G.I.P., fully *Lustrawaxed* so that they can be heat sealed on automatic machinery. The design is printed in three-colour gravure, and consists of a simple, predominantly black, front panel, on a bright yellow ground. The reverse of the pack is occupied mainly by a white panel carrying a sales message and description.

Boilable packs

A new packaging film which remains stable in boiling water and also under normal conditions of deep freeze is now being marketed by Whiffen and Sons, Ltd.

The film is *Ralsin*, a tough transparent material claimed to be capable of withstanding temperatures ranging from −40°C. to +140°C. It is suitable for the packaging of foodstuffs intended for cooking or boiling in their packs; an additional advantage is that it can be pasteurised and where necessary sterilised with its contents.

The film is claimed to be non-toxic, impermeable to gases and water vapour and resistant to fats, oils and grease. Among its uses are cook-in-the-pack fish fillets, packs for cheddar cheese and the packing of soups and other liquids.

Sultanas, currants and mixed fruits are now being packed by W. Gleason and Co., Ltd., in new cartons designed and printed by the Paper Group of the Metal Box Co., Ltd. They are made of white lined chip board and carry a panel showing the contents printed in full colour with what is claimed to be startling realism. The rest of the printing is red, yellow and black, with a blue flash to carry the supplier's name.

Untreated board for cartons

By careful consideration of the board used, the produce and its cabinet life, it is often possible to recommend an untreated pack which is completely suitable.

The newly designed *Seamaid* Frozen Sea Foods carton for six fish-cakes is such a pack which has four colour printing in red, yellow, blue and black.

This bright carton for Quick Freezers, Ltd., is in 0·016 white lined Manila board with tuck-in ends and with lock slits on bends.

Advances in Food Technology

CEREALS

Air classification of soft wheat flour

Repeated air classification of a conventionally milled soft red winter wheat flour (56.2% extraction, flour basis) containing 7·8% protein, starting with separation at low critical particle size, yielded seven fractions containing from 22% protein for the fraction with the smallest particle size to 2·5% protein. Other indices such as ash, diastatic activity, alkaline water retention capacity, thiamine, fat, and MacMichael viscosity generally increased with increasing protein content. Specific gravity, bulk density, and *p*H increased with decreasing protein content. Farinograph and extensigraph tests showed an increase of absorption and strength properties with increasing protein content.

The relationship of protein content versus flowdynamically determined particle size of a soft wheat flour was established. Another relationship was established—namely, the protein content of coarse and fine fractions as a function of critical particle size at which the parent flour was separated in individual process steps. The intercept of this curve pair determines a particle size called the "neutral critical cut" under which individual flowdynamic separations produced fines with higher protein content than the coarse fractions. Above this "neutral critical cut" a small but reversed protein shifting was evident. For the measurement of protein shifting within the fractions of a flour, an index is proposed which designates in percentage the amount of protein in the parent flour which was shifted out or into the fractions; this index in the present study was found to be $\delta = 27.7\%$. Factors of flowdynamic size such as geometric measurement, density, and shape are analysed.—Rezsoe Gracza, *Cereal Chemistry*, 1959, **36**, 465.

Lysine supplementation

Rat-growth studies were carried out with diets in which a commercial white bread and three representative types of commercial protein bread were the sole sources of protein, with and without lysine supplementation. The percentage of protein from wheat varied from 89 to 60%, that from milk and soy proteins from 11 to 40%. Over this range of compositions, the protein quality as measured by the protein efficiency ratio was found to be a direct function of the lysine content of the mixed protein, regardless of whether the lysine was a constituent of protein or was added as L-lysine monohydrochloride. For protein efficiency ratios in the high-quality range of 2 or higher, it appears necesary that the bread protein contain at least 200 mg. of L-lysine per gram of nitrogen.—J. W. Brown, N. W. Flodin, E. H. Gray, and O. E. Paynter, *Cereal Chemistry*, 1959, **36**, 545.

STARCH

Pregelatinised starches for the processor

A pregelatinised starch is produced by cooking and drying the starch dispersion on heated rolls or drums. This process involves feeding a starch slurry (after completion of processing, refining, and blending with other starches, sugars, etc.) on the outer surface of a steam-heated revolving drum. The rate of rotation of the drum is set so that the material is dried and scraped off by a doctor blade when the drum reaches a certain position. The operation can be performed on single or double drums, with the latter providing greater capacity. This pre-cooking process swells the starch granules and thus conditions them to thicken and gelatinise in cold liquids, without need for subsequent heating. Thus, the starch manufacturer is doing the actual starch cooking operation in his own plant. By this method, gelatinisation time, gel texture, stability and composition can be engineered into the starch according to the requirements of the food manufacturer's equipment and the food product involved. Product uniformity from item to item and batch to batch is assured and the user is relieved of the costly cook-up and gelatinisation control operations necessary with ordinary starches.

Unfortunately there is a dearth of literature (except for patent claims) on pregelatinised starch use and application. This paper outlines some of the advances made in the starch technology field in recent years and provides suggestions on how a food processor can take advantage of the properties of pre-cooked starches through proper examination, control and intelligent application.—L. M. Waldt, *Food Technology*, 1960, **14**, 50.

Technical Press Review

May

Automation Progress.—Industrial Applications of *p*H Control; Attitudes to Automation in Britain and the U.S.A., Polarographic Analysis and Process Control; British Electric Servo Motors; Standardisation and Automation; Automation on the Railways—3.

World Crops.—Impressions of Kenya; Portuguese Resettlement Project; Salt Marshes and Salt Deserts; Scald Reclamation with Primary Cover Crops.

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Petroleum.—Tank Truck Design: Theory and Practice; Underground Oil Storage; Density Determinations in Refinery Tankage; Bulk Storage and Distribution: Equipment Review; Natural Gasoline Recovery: Some Economic Aspects—1.

Dairy Engineering.—The Effect of Mechanical Handling on the Design of Dairies; Laying out In-place Cleaning Circuits; Bottle Washing Problems and their prevention; Practical Cleaning Routines for the Dairy—IV; Preview of the Mechanical Handling Exhibition.

Paint Manufacture.—Mechanical Handling Exhibition; Advanced Paint Chemistry—IX; Segregated Pilchard Oils—III; Carbon Black Pigments; Silicones Improve Wax Polishes IV.

For specimen copies write to Leonard Hill House, Eden Street, London, N.W.1.

Correspondence

Radiation sterilisation: the experts reply

SIR,

The short history of preserving foods with ionising radiations has been periodically bedevilled by dogmatic prophecies of its great future, or lack of future. You, sir, in your editorial (Radiation sterilisation: the end?[1]) did nothing but aggravate the situation and mislead your readers.

These are the essential facts behind the recent changes in the American programme. In the last five years the U.S. Government has spent about $11,000,000 on such research; during the next five years it intends to spend at $10,000,000.[2] Can you maintain that this is the end, or that the American Government has lost faith in the process?

Few would deny, of course, that the decision not to build the U.S. Army Ionising Radiations Centre was a major setback; but we wonder how many people would have had an easy conscience after spending $7,500,000 on such a plant at the present time. Many observers on this side of the Atlantic thought the project prematurely large—and obviously the majority of Americans also shared this opinion. Those acquainted with the situation were not wholly surprised when the cancellation was finally announced.[3] It is worth noting, though, that the revised plans still call for a similar centre, this time on a more reasonable scale. Furthermore, about half of the future American effort is to be applied to low dose treatments of foods for civilian use.

Your attitude in condemning radiation processing because it does not cook the food seems remarkable; do you condemn refrigeration, for example, on that account? Indeed, one of the hopes which irradiation offers is a sterile product which is not inevitably overcooked.

As for your other comments, you might well be right in asserting that people will not want to eat irradiated foods. Equally, you might be wrong; but it is too early to argue profitably about this: only time, and actual trials, can decide. On economics, you are evidently out of date: some radiation processes, were they acceptable in other respects, could compete with conventional methods. To have advanced so far in ten or fifteen years suggests that it may not be long before irradiation is both economical and practical in some cases. However, these are all polemical questions at present.

May we plead for time, and a peaceable atmosphere, to learn more about the subject?

B. COLEBY,
M. INGRAM,
Low Temperature Research Station, Cambridge.

1. FOOD MANUFACTURE, 1960, **35**, 135.
2. "Government increases research on radiation processing of foods." U.S. Dept. of Commerce Press Release, March 28, 1960.
3. "Is recent criticism of food irradiation justified?" M. Ingram and B. Coleby, *Chem. Ind.*, 1960, 360.

(Editor's note: *We did not condemn radiation sterilisation; we were merely expressing an opinion regarding its prospects. If its sponsors can make this method do all that conventional methods can, and as cheaply, more power to their e'bows!*)

Bacon industry's troubles

SIR,

Your correspondent who suggested a Bacon Industry Board as the answer to our present troubles ought to be aware that there is already in existence the Pig Industry Development Authority which has many of the powers and functions which he would assign to a Board, although not that of marketing or the physical disposal of surpluses.

As a guide to curers, the Authority, with the full co-operation of this Federation, has issued a "Code of Practice for the Production of Tank Cured Wiltshire Bacon," but I suggest the price realised by British bacon, which is at present within 2s. per cwt. of Danish, is indication of a reasonably high standard of quality.

It is not quality that bedevils the Industry but the other difficulty referred to—lack of continuity. The bacon curers in this country have to compete for a diminishing supply of pigs against the other pig-using industries who are not subject to competition from unlimited imports. If the Government can find a policy which will overcome the fundamental difficulty of the industry in obtaining regular supplies of pigs for curing at an economic price, your correspondent need have no fear for the future.

Give us the pigs and we will finish the job!

K. GREEN,
Secretary,
British Bacon Curers' Federation,
28, Victoria Street,
London, S.W.1.

Judging flavour

SIR,

I have read Dr. Sheppard's article on Flavour with great interest. For many years I have worked as a scientist in the tea industry. Now, after experience ranging over more than a century, the industry is able to correlate variety of bush, climate, and method of manufacture with liquoring qualities and flavour. We are at present attempting to link up quality and flavour with chemical analysis—with indifferent success.

C. A. HARLER,
Nevill Court,
Tunbridge Wells.

Standards of Nutrition–I

(*Concluded from page* 206)

55. B. Sure. *Am. J. Clin. Nutr.*, 1956, **4**, 211.
56. E. F. Terroine. *Quart. Bull. Health Org.*, League of Nations, **4**.
57. A. R. P. Walker. *Am. J. Clin. Nutr.*, 1954, **2**, 255; **3**, 114.
58. E. M. Widdowson, O. G. Edholm and R. A. McCance. *Brit. J. Nutr.*, 1954, **8**, 147.
59. E. M. Widdowson. *Proc. Nutr. Soc.*, 1955, **14**, 142.
60. Grace Goldsmith, 1953, Chapter 23 in "Biochemistry and Physiology of Nutrition," G. H. Bourne and G. W. Kidder, Academic Press, New York.

Machinery and Equipment

COMBINED TEMPERATURE CONTROLLER AND INDICATOR

A new indicating temperature controller has been introduced by Honeywell Controls, Ltd.

Designed for heating and cooling operations, it serves the double purpose of controlling and indicating temperatures in ovens, cookers, plating baths, dryers and similar industrial applications.

A highly sensitive, remote bulb, liquid-filled thermal system operates a single-pole, double-throw, Honeywell micro-switch which can either open or close a circuit on temperature rise.

A selection of ranges is available from −50°F., to +1,200°F.; centigrade scales available if required. Both case and capillary are fully compensated for ambient temperature variations. The set point can be changed by means of a knob on the front of the case and both the indicated temperature and set point are made clearly visible by magnifying windows.

HIGH-SPEED WRAPPING

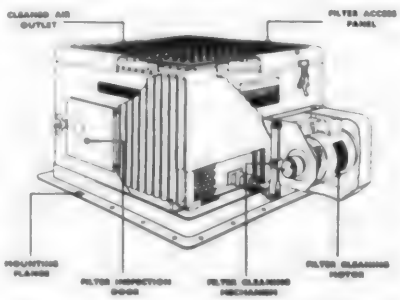
On the combined British stand at the Interpak exhibition, Soag Machinery Co. showed a new Hayssen Model 3-13 high-speed wrapping machine, shortly to be produced in this country. The machine is claimed to overwrap automatically a wide variety of carton sizes in any normal heat sealing material from the reel, at speeds of up to 50 wrapped packages per minute, and, the makers say, has proved a most successful unit for frozen food and fish, cereals, and pharmaceutical products, in America. Electric eye device can be fitted, enabling wrapping material preprinted by sections to be automatically and accurately registered to the package.

SCREW ELEVATOR

The latest development of James Hodgkinson (Salford), Ltd., is the High Speed Screw Elevator. It has been designed primarily for handling boilerhouse smalls where for one reason or another it is not convenient, or possible, to prepare a concrete ground hopper or pit. The makers claim that for feeding the hoppers of "Low Ram," chain grate or underfeed stokers under such circumstances it is ideal.

Each unit will handle up to 1½ tons of smalls per hour and feed direct to the stoker simply by resting the tail on a pile of coal and lifting the head into position over the stoker hopper. The elevator is entirely self-cleaning and no

Two Honeywell instruments. (*Above*): The bellows flowmeter, claimed to be the most stable yet developed, can be used with almost any process fluid. (*Below*): The indicating temperature controller serves the double purpose of controlling and indicating temperatures in ovens, cookers, dryers, etc.



A Dallow Lambert "Unimaster" venting dust control unit.

running maintenance is required since the bearings are grease packed and sealed for life.

FIBREGLASS RECEPTACLES

A range of fibreglass reinforced polyester plastic containers with the characteristic qualities of fibreglass materials—lightness and strength—is manufactured by Aktiebolaget Hven Plast of Malmö, Sweden, and distributed in this country by Albrin Products, Ltd. The containers are manufactured in a wide range of sizes, and can also be supplied with adjustable legs made of stainless, acid-proof steel, or with wheels, as well as with a draincock if required. They are specially recommended by the makers for use in slaughterhouses, for bacon and ham curing, for sausage factories and for food preserving.

ANTI-STICK FINISHES FOR LABELS

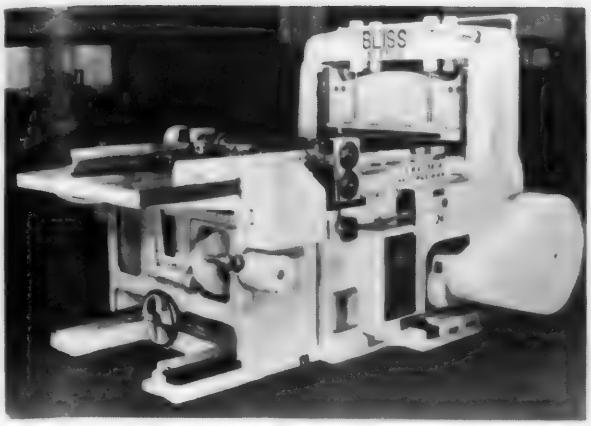
Among the new silicone products which have recently been added to the I.C.I. range are DP. 42, a 100% silicone fluid, and DP. 111, an emulsion of DP. 42 in water. These products are designed as finishes for paper that is used to back self-adhesive plastic films and labels and, it is claimed, impart a non-migrating, anti-stick finish.

SILICONE ANTI-FOAM

Another recent product of the I.C.I. Nobel Division is a new silicone antifoam, M.436, for use in the preparation of foodstuffs in aqueous systems where foaming may occur. M.436 contains no preservative and, it is claimed, gives improved and more uniform dispersion.

DUST CONTROL VENTING UNIT

Dallow Lambert have produced a new dust filter—the *Unimaster* Venting Unit—designed to handle dust problems associated with pneumatic conveying systems, in cases where it is necessary to filter the air displaced before discharging it to the atmosphere. The venting unit is made in two sizes, having 50 and 100 sq. ft. of fabric filtration area respectively, and is fitted with fully motorised automatic cleaning gear which can be interlocked with the blowing system so that it operates as the blowing ceases. Units can also be joined and interlocked together to give continuous operation, if the blowing is continuous. The unit can be mounted directly on top of storage silos—it can be supplied with standard weatherproof protection for outside installation, if required—or on top of storage hoppers or primary separators.



(*Above*): **This new Bliss 1103 scroll shear is claimed to offer higher rates of output in production of can ends.** (*Right*): **A Herbort automatic fruit strigging machine, supplied by Mason and Morton, Ltd.**

STRIP-PACKAGING MACHINES

The Packaging Division of Gordon and Gotch, Ltd., have recently announced details of the Wolkogon strip-packaging machines now available in Britain. The models include tablet counting and filling machines, and others for catch cover sealing; liquid packaging, tablet, pill, dragee and powder packaging. The LA/1, a liquid packaging machine, is the latest addition to the range. It has an out put of 40 to 60 sachets per minute (with a maximum capacity of 20 g.) and permits the use of all heat-sealable materials including paper; it is suitable for packaging liquids of any density. Each machine, the manufacturers state, can rapidly be changed over from one product or material to another, and provision is made for precise centring of printed matter over the packaged product.

AUTOMATIC STALKING AND WASHING MACHINE

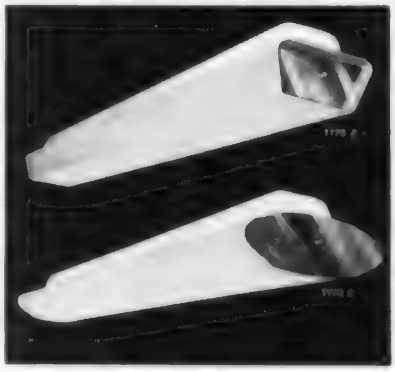
Of particular interest is the fully automatic nature of the new Herbort Stalking and Washing Machine No. 28A/S, which has recently been produced by August Herbort of Braunschweig. This machine stalks and washes practically all types of stem fruit and berries, and all impurities and foreign matter are completely separated in the process.

A modern tubular chassis carries an inclined set of small diameter rods, covered in rubber, rotating in pairs. Fruit from the feed hopper travels down the grid and is subjected to a powerful water spray (except in the case of frozen fuit). A mechanical spreader built into the machine replaces the 2-3 operators which have previously been required to disperse the fruit over the grid. This spreader, powered by a special geared motor, simultaneously loosens any fruit or stones which might otherwise remain trapped between rollers. Whilst the stalks and dirt particles are caught by the fast rotating rollers, the fruit slides undamaged down the grid in a stream of water. The manufacturers say that the roller rubber now has a much improved life, because of the continuous clearing of fruit and stones which previously caused considerable wear and tear. The machine is supplied by Mason and Morton, Ltd.

FLUORESCENT LIGHTING

A new range of commercial fluorescent lighting fittings, the *Litemaster* range, has recently been introduced by the Benjamin Electric, Ltd., the first time that this company has embarked upon a range of commercial fluorescent fittings.

The complete range is built around two basic units which, the makers say, are easy to install and maintain, and which are adaptable to suit individual tastes and requirements. The ribbed acrylic plastic diffusers are designed to slip instantly into position on the channel, and the end-plates are easily removed to enable cleaning and maintenance to be carried out.



The two basic units of the " Litemaster " range of commercial lighting fittings introduced by the Benjamin Electric, Ltd.

PROTECTIVE GLOVES

A few months ago, James North and Sons, Ltd., introduced a new kind of protective glove, the North *Jomac*, made of a special hard-wearing loop-pile fabric. This, the makers say, gives unusual insulating properties against heat or extreme cold, as well as being exceptionally resistant to abrasion. In response to requests from industry, the range has now been enlarged and expanded to cover mitts and sleeves, etc.

SCROLL SHEAR

The Container Machinery Division of E. W. Bliss Company has developed a new scroll shear for the high speed automatic production of scrolled strips used in the manufacture of can ends, screw caps and similar closures.

Improvements over the older models to be found in the new Bliss 1103 automatic shear includes elimination of the idle stroke between sheets (every stroke is a cutting stroke). The machine is capable of shearing sheets up to 36 in. square, and is fitted with trimming cutters that can be ground in place by means of a standard grinder.

The shear can be adapted to either lithographed or plain sheets, while magnetic feed bars and hardened back gauges are claimed to ensure precise registry of the sheet for each cut.

News Digest

Scientist says Two in Five are Underfed

At least two persons out of every five in the world today were living on a totally inadequate diet, said Prof. J. Hawthorn, of the Royal College of Science and Technology, Glasgow, addressing a meeting of the British Food Manufacturing Industries Research Association, in Edinburgh on March 30. In this setting, food science became a subject of extreme importance.

In Britain there was no degree in food science as a subject in its own right. "I am glad to be able to tell you that action to amend this state of affairs is being taken in Glasgow University now," said Prof. Hawthorn (who has occupied the chair of food science for the past two years), "and two English universities are likely to follow this lead before very long."

The need of the undeveloped countries for food scientists and technologists was greater, perhaps, than we could hope to produce for them. Those countries would have to set up institutions to study the subject, and we could make our best contribution by training the teachers to run the new institutions.

Roast veal tastes slightly soapy after having been in a can for 135 years but it is still quite pleasant, said the man who ate it, Dr. F. H. Banfield, director of the Association, at the meeting. The tin of veal was recently the property of Miss Jean McNeil Caird, of Edinburgh, who used it as a doorstop. She always thought the tin contained plum pudding.

It was manufactured in 1823 by the first maker of tinned foods in this country, a Bermondsey firm whose earliest output was used for provisioning ships of the Royal Navy for their long voyages of exploration to the Arctic which were made from 1815 onwards. It was one of these tins of food that Miss Caird owned and when it was opened in December, 1958, the veal was sampled by Dr. Banfield. He said: "I only had a small piece but I was agreeably surprised at the taste after all these years."

Sixth Food Fair

The sixth Food Fair, organised by the Food Manufacturers' Federation, will be held at Olympia from September 1 to 17.

The organisers state that record bookings have so far been received. One of the reasons for this is thought to be the fact that the amount spent on food in Britain has continued to increase, and is now double that spent ten years ago. This year's Fair is expected to be the most comprehensive ever staged in Britain, and will show how more attractive and more varied food is being made available.

Heat-resistant white enamel

A new white enamel compound that is said to be especially resistant to heat and to chemical attack and which, it is claimed, will not discolour or become yellow when exposed continuously to artificial light and conditions of poor air circulation, has been developed, according to a recent *Financial Times* report.

It is expected that the compound will be particularly useful for coating equipment used in the food industry, since it is said to contain chemical additives which combat mould spores and fungus growth, and could therefore be used as a surface coating for containers which are used for food storage over long periods of time.

Henry Denny expansion

It was announced recently that as a result of negotiations completed in March two of the oldest companies in the bacon industry have now come under one control.

Henry Denny and Sons, Ltd., a company which has been in the bacon trade for 140 years, have acquired from Hygrade Food Products Corporation of Detroit, Michigan, the well-known Belfast bacon and ham curers J. and T. Sinclair and Co., Ltd., who have been established for 127 years. The purchase included J. and T. Sinclair's bacon curing factory in Belfast, an abattoir at Moy, Northern Ireland, a cold store in Liverpool and sales offices in London, Glasgow, Manchester and Liverpool.

This sachet of "Spree" is a new soft drink product from Unilever subsidiary Poulton and Noel, and is designed to eliminate bottle handling problems.

British Standard for colouring matter

The British Standards Institution have announced the first of the British Standard specifications for colouring matter permitted for use in foods by the Colouring Matter in Food Regulations, 1957. The specification—for Tartrazine (B.S. 3211: 1960)—lays down limits for matter volatile at 135°C., matter insoluble in water, diisopropyl ether extract, subsidiary dyes, phenylhydrazine-p-sulphonic acid, chloride and sulphate, dye content, copper, arsenic lead, and heavy metals (as sulphides).

This standard, which has been prepared by a technical committee representative of dye manufacturers, food manufacturers, research associations, Government departments and scientific and professional organisations, is expected to be acceptable in international trade, since it complies with the requirements of overseas standards.

Removal of import duties

Among provisions made under the Import Duties (General) (No. 2) Order, 1960, recently announced by the Treasury, is the removal of the existing import duty on certain food preparations containing cocoa, liquefied herring, and spearmint oil. The Order came into operation on March 14.

Fresh Food Packaging Exhibition

The International Prepacking Exhibition which was staged for the first time in London in October, 1958, is to be held in the autumn of alternate years, and will in future be called the Fresh Food Packaging Exhibition, it is announced. The next event is to take place at Alexandra Palace from November 1 to 4, this year.

New soft drink in sachets

A squash which sells on sight, presents no storage problems and no bottle disposal problems, keeps indefinitely, and is cheap enough for children to buy, is the aim of Poulton and Noel, Unilever subsidiary and producers of Spree, a lemon and orange squash in a 4d. sachet. Other flavours will be added later.

A new bottling store at Tadcaster which has recently been completed for Hammonds United Breweries was opened by the chairman, Mr. H. L. Bradfer-Lawrence, on March 29. The store cost £500,000 and replaces the three existing stores at Bradford, York and Rotherham, at the same time increasing their capacity by 20%. The Tadcaster store will bring about a considerable reduction in distribution and production costs. Space for two bottling lines has been allowed. The first now in operation has a capacity of 1,200 bottles per hour. The store is divided into four units: administration, preparation of beer for bottling, bottling hall, and storage area. The photos above show (left) *a general view of the store, and* (right) *the bottling line.*

Cellulose casings at Leamington Spa

Whole middles and half-sides of bacon moulded and cased in Fibrous casings by the new type large *Meta* press, a new red opaque casing and skinless Frankfurters made with a newly developed basic mix were introduced by Viskase, Ltd. at a private exhibition at the Regent Hotel, Leamington Spa on March 15 and 16. This was the first exhibition of its kind staged by the company and was designed to demonstrate the wide range of their casings and the variety of their uses to processors in the Midlands, South-West England and South Wales.

Pigs' tongues (*above*), pneumatically moulded and cased in fibrous casings by the "Meta" press, and liver sausage (*below*), in moisture-proof fibrous casings, were among the exhibits shown by Viskase, Ltd., at their recent exhibition at Leamington Spa. The meat is cooked in the casing, which is claimed to reduce cooking losses and prevent drying out.

Antarctic party eat 50-year-old biscuits

A recent report in the *Star Weekly*, Toronto, gives an account of the extraordinary discovery, by a scientific expedition to the Antarctic, of Sir Ernest Shackleton's hut and provisions, still in a perfect state of preservation after fifty years. Members of the party brewed tea left by Sir Robert F. Scott in another hut at Cape Evans, and ate fifty-year-old biscuits and syrup. The biscuits were made by Huntley and Palmers, Ltd., and the tin by Huntley, Boorne and Stevens, Ltd.

New Heinz premises for Sheffield

The new Sheffield branch offices and warehouse of the H. J. Heinz Co. were officially opened on Thursday, March 31.

The building is the sixth in a series of new distribution centres which have been erected in accordance with the Company's overall development scheme.

New Heinz packet soups for Scotland

At a press reception held in Glasgow on March 15, the first packet soups ever to be put on the market by H. J. Heinz Co. were launched. The new soups, in laminated foil packets retailing at 1/6d., come in six varieties: Chicken Noodle, Chicken, Clear Vegetable Mushroom, Onion (French Style), and Pea with Ham, and will, for the time being, be available only in Scotland, where the consumption of soup is considerably higher than in the rest of Britain.

New Heinz Research Centre and Head Office approved

Following the public enquiry which had been ordered by the Minister of Housing and Local Government, H. J. Heinz Co. has now been given outline planning permission to develop the 65-acre site which it had conditionally purchased at Hayes Park, Hayes End Road, Middlesex.

At Hayes Park, the company will erect an administrative building and a food research centre which together will form the new Heinz headquarters in Britain. Work on the detailed plans is now going ahead.

It is not possible to say at this stage when work on the site will begin; but it is safe to forecast that the buildings, which will have a total floor area of over 100,000 square feet and cost in the region of £1 million when fully equipped, will not be ready for occupation before the latter part of 1962.

Only a small area of this very attractive site in London's Green Belt will be developed by the company; the buildings themselves will probably not occupy more than 1½ acres. The proposal is that a house, presently used as a private nursing home, will be demolished and the buildings erected in that area. The surrounding park, over 20 acres of woodland and a similar area of pasture, will be preserved so that the rural character of the area will remain as beautiful and undisturbed as it is now.

Harris acquire Scottish firm

The old-established Stirling Bacon Curing and Pork Product firm of McGrouther, Ltd., has been acquired by C. and T. Harris (Calne), Ltd., of Calne, Wilts. The business of McGrouther, Ltd. will continue under its own name, and Mr. D. H. McGrouther will continue as managing director.

New Scottish poultry plants

Buchan Poultry Products, Ltd., of Maud, Aberdeenshire, have now opened a new poultry processing plant at Ellon, Aberdeenshire. This new unit is geared to handle 700 processed birds per hour and to step up, if required, to 1,400 per hour. This firm began production of poultry meat in 1952 after a successful career in egg marketing, where they are now Scotland's largest producers. Last year their poultry meat sales approximated £594,000. The new plant is one of the most modern in the country.

Russian meat technicians' visit

Four Russian meat technologists, Messrs. V. Aslanov (leader), representing the Moscow Meat Processing Factory, V. Barkhalov, V. Evdokimov and M. Andersen, recently made a fortnight's study tour of the U.K. meat industry. The visit was sponsored by the British Council for the Promotion of International Trade.

Confectionery diploma course

The two-year full time course in Chocolate and Sugar Confectionery at the Borough Polytechnic, London, S.E.1, is the only one of its kind in the U.K. It is intended to give students a knowledge of raw materials and processing methods, together with the fundamentals of science, engineering and design, and an introduction to commercial procedures. Applications for admission to the course beginning September 22 should be made without delay.

Summer course

A residential summer course on "Recent advances in food science" will be held from September 5 to 19 under the auspices of the Low Temperature Research Station, Cambridge, the Royal College of Science and Technology, Glasgow, and the Torry Research Station, Aberdeen. The members of the organising committee are Dr. E. C. Bate-Smith, Prof. John Hawthorn and Dr. G. A. Reay, and it will be held at Chesters House in Glasgow. Admission to the course is being restricted to 70, and applications should be made not later than June 13 to the Department of Food Science, Royal College of Science and Technology, George St., Glasgow, C.1. A number of Government bodies and industrial organisations are co-operating in running the course.

Buxted Chicken Co. buys Essex packers

The Buxted Chicken Co., Ltd., has acquired a third packing station by buying the firm of Poultry Packers (Essex), Ltd., and its associate company Broiler Services, Ltd.

With the addition of the 30,000 chickens processed weekly at the Boreham, near Chelmsford, plant of the Essex firm, the Buxted company's weekly production is now approaching 200,000 birds.

Poultry Packers (Essex), Ltd., was formed in 1952 to process all types of poultry, and was one of the first firms in the country to confine its processing almost exclusively to broilers. Mr. John Ogier, founder and managing director, remains on the board of the Essex firm. The other directors are Mr. Anthony Fisher (Buxted's chairman), Mr. Tony Pendry (Buxted's managing director), Mr. Owen Davey (Buxted's production director), and Mr. S. Sutherland Smith (Buxted's marketing director).

Forthcoming Meetings

S.C.I. Food Group, 14, Belgrave Square, London, S.W.1. Wednesday, May 11, 6.15 p.m.: Annual General Meeting. "Changes in Dietary Fats in the last hundred years" by Prof. T. P. Hilditch.

Institute of Plant Engineers: May 18, 7 p.m., Royal Society of Arts, John Adam St., London, W.C.2, "Factory safety." May 26, 7.15 p.m., Exchange Hotel, Liverpool, "Packaging and container engineering" by E. Evans.

Society of Dairy Technology: May 30 to June 2, Spring Meeting at Marine Hotel, Troon, Scotland; papers and visits.

Company Profits & Prospects

H.P. Sauce, Ltd.

H. P. Sauce, Ltd., announced recently that their group profit for the year 1959, after all charges, including taxation, was £731,477, compared with £651, 604 in 1958. The annual general meeting of the company will be held on May 3.

Van den Berghs and Jurgens, Ltd.

The directors of Van der Berghs and Jurgens, Ltd., have announced that their trading profit for the year ending December 31, 1959, was £7,325,253, as against £4,761,650 for 1958, and that the net profit for the year, after charging taxation, was £4,196,945.

Birds Eye to spend more millions

It was announced recently that Birds Eye Foods, Ltd., are to invest a further £7 million in the quick-frozen food industry in Great Britain during the next three years.

New development areas

The Board of Trade announced recently that the Parliamentary Secretary has offered special inducements to companies to expand in areas where unemployment is persistently high. These areas include Plymouth, Isle of Wight, Anstruther and Dunfermline.

Bowyers increase dividend

Mr. Raymond J. Harris, chairman of Bowyers (Wiltshire Bacon) Ltd., stated in his annual report that the firm's profits had shown a modest increase in the past year despite the adverse conditions in the "Wiltshire" curing industry. He attributed this increase, in the main, to their policy of expanding

Four Soviet meat technicians recently visited the U.K. and are seen here at the Packaging Centre in London. From left to right, Mr. V. Aslanov, Mr. V. Barkhalov, Mr. L. C. Bingham (sales director of Tobenoil, Ltd.), Mrs. J. Horrocks, Mr. P. A. Timberlake (British Council), Mr. M. Andersen, Mr. N. Smith (who is demonstrating a wrapping machine) and Mr. V. Evdokimov.

New products. (*Left*): **Three of the principal lines of the new Lyons subsidiary, Rolls Confectionery, Ltd., "Whispers," "Mint Chocs" and "Sunfresh Slices."** (*Right*): **The first packet soups to be marketed by Heinz, which for the time being will be available in Scotland only.**

the manufactured meat products side of the business and the development of entirely new and more profitable methods of production and distribution of a wide variety of meat products.

The trading profit for the year ended September 30, after charges, amounted to £64,342 (£55,453) and a dividend of 12% less tax, as against 10% less tax, for the previous year was recommended.

Mineral Water Engineers Association

The Mineral Water Engineers Association, believed to be the oldest engineering trade association in the world, held its 65th annual general meeting in London on March 30, followed by the annual dinner.

The following elections were made: chairman, Mr. Leslie Clarke, M.B.E. (Bratby and Hinchliffe, Ltd.); vice-chairman, Mr. A. J. Meadowcroft (W. Meadowcroft and Sons, Ltd.).

The president of the association is Mr. A. P. L. Blaxter, of Barnett and Foster, Ltd.

M.W.E.A. is affiliated to the Food Machinery Association and constitutes its Mineral Water Machinery Section. It is represented on the F.M.A. Council by the chairman and vice-chairman.

Henry Simon (Holdings), Ltd., T. and T. Vicars, Ltd.

The boards of T. and T. Vicars, Ltd., and Henry Simon (Holdings), Ltd., announce that Simon has made an offer for the whole issued capital of Vicars.

The board of Vicars is recommending the offer to the shareholders, and Associated British Foods, Ltd., which owns a controlling interest in Vicars, has announced its intention to accept.

Pelkman Brothers, Ltd., a subsidiary of Vicars, is included in the offer, but the subsidiary R. W. Barraclough, Ltd., is not.

Vicars have a long established and world-wide business in biscuit and bakery machinery with head offices and works at Earlstown, Lancashire.

The purchase of Vicars is a development of the policy announced last year by Simon that it was entering the bakery machinery field, as being complementary to its existing world-wide business in flour milling machinery.

Negotiations for the purchase of Vicars were entered into more than six months ago, and it is expected that the transaction will be completed this month.

The board of Simon state that they intend to preserve the continuity of the Vicars business, but also hope to expand it by the addition of new lines of bakery equipment.

Kraft Foods have added Scotch Cheddar to their "Cracker Barrel" range of pre-packed natural cheese. It is available nationally in packets of approximately 8 oz. wrapped in transparent pukkafilm. It is claimed that stored in a cool place, this rindless cheese will keep without deterioration for much longer than fresh cheese wrapped in greaseproof paper.

Changes of Address

Angel Truck Co.

The new premises of the Angel Truck Co., Ltd., are 242-244, Billet Road, Walthamstow, London, E.17.

Reed Corrugated Cases, Ltd.

The head office of Reed Corrugated Cases, Ltd., has been transferred to Reed House, Kew Bridge, Brentford, Middlesex.

Also included in this move was the sales promotion and advertising department.

Klaxon, Ltd.

With effect from March 30, the London sales office of Klaxon, Ltd., will be at 189-191, Drummond Street, London, N.W.1., telephone EUSTON 4102 and 4143.

Haven Foods, Ltd.

Haven Foods, Ltd., have moved their head office to Berisford House, Mark Lane, London, E.C.3., where their associated companies in the Berisford Group are already installed. This move has brought the company within the administrative centre of the cereal and canned goods trade. Production at the High Wycombe and Manchester factories will continue as before.

British Vacuum Cleaner and Engineering Co., Ltd.

The name of this company has now been changed to Goblin (B.V.C.), Ltd., incorporating both "Goblin" and "(B.V.C.)." The name of the British Vacuum Cleaner and Engineering Co., Ltd., is being retained as a subsidiary company to market all industrial vacuum cleaners.

PEOPLE

R. H. Corbett and Co., Ltd., announce the appointment of MR. C. WHITE as sales manager. Mr. White, formerly with J. Collis and Sons for nine years, assumes responsibility for home and export sales and his appointment is linked directly to the greatly increased productive capacity available to Corbetts following their move into the premises of their parent Company, Woodfield Rochester, Ltd.

*

MR. WILLIAM L. MATHER, O.B.E., M.C., T.D., was appointed chairman of the board of Mather and Platt, Ltd., on April 1. He is the fifth generation of his family to be in the company. Educated at Oundle and Trinity College Cambridge, he has travelled widely, and before the war served in the company's Paris and Calcutta offices. During the war he served with the Cheshire Yeomanry, which he subsequently commanded for three years, and was twice wounded.

*

Four directors of the new Lyons subsidiary, Rolls Confectionery Ltd., are the managing director, MR. GUY LAWRENCE; the marketing director, MR. STUART DORIZZI; the sales director, MR. ALASTAIR MCINDOE, and the commercial director, MR. NORMAN PRINGLE.

Mr. Lawrence is 45 and was a bomber pilot during the war. He has three children. Mr. Dorizzi is 42, was a "met." man in the R.A.F. and is a

Mr. N. Pringle

Mr. S. D. Dorizzi

member of the Royal Statistical Society. Mr. McIndoe, 33, was a lieutenant in the Scots Guards. Mr. Pringle, 44, spent three years during the war as a P.O.W. in Japanese hands. Mr. Lawrence was managing director and owner, and Mr. Pringle a director, of Glacier Foods, now a Lyons subsidiary.

*

MR. J. M. PINKHAM has resigned from the Board of O. R. Groves Ltd., to take up a new appointment with Polak and Schwarz (England) Ltd., as marketing manager of the Flavour Division.

United Glass, Ltd., announced recently that as part of their decentralisation policy, two divisions, one in England and one in Scotland, have now been formed. MR. A. S. RAILTON has been appointed Divisional Managing Director for England, and MR. P. JONES for Scotland.

The Company also announced the appointment of two directors, MR. F. T. KNIGHT and MR. H. T. A. HASTIE, of their subsidiary company, The Alloa Glass Work Co., Ltd.

*

At his own request, SIR WILLIAM GARRETT relinquished his executive responsibilities with Monsanto Chemicals, Ltd., on April 1, in order to devote more time to his other interests. He will continue as a member of the board.

Mr. A. R. McIndoe

Mr. G. Lawrence

Since 1957 Sir William had, among his other executive activities, held the position of personnel director of Monsanto Chemicals Limited. These duties will now be assumed by MR. N. F. PATTERSON, director in charge of engineering and purchasing.

Sir William is chairman of the Association of British Chemical Manufacturers and a director of Metal Industries Limited. He is a member of the Civil Service Arbitration Tribunal. He was president of the British Employers' Confederation from March 1958 until March 1960.

MR. S. E. CHALONER has been appointed controller of personnel of Monsanto Chemicals, Ltd., and will be responsible for the personnel function in the company including staff relations,, recruitment and training, general personnel and industrial relations policies. He has been with Monsanto for 35 years and has had previous experience of research, production and personnel management at factory level. A graduate of Manchester University, he is a member of the Executive Board of the Association of Chemical and Allied Employers, a Governor of Hendon Technical College and a member of the Institute of Personnel Management.

*

MR. S. FLOWER succeeds Mr. W. J. Batchelor as frozen foods marketing manager of Smedley's, Ltd. The latter has taken up a new appointment outside the food trade.

Mr. C. White

Mr. W. L. Mather

MR. W. G. FRIGGENS, B.SC.(HONS), A.M.I.E.E., has been appointed director and general manager of Manufacturers Equipment Co., Ltd.

MR. L. D. DALE, who has been with the company for some time as sales manager, was appointed sales director on January 18.

*

Mr. H. J. Heinz II announces that he has accepted with regret the resignation of MR. W. B. CORMACK from the board of H. J. Heinz Co., Ltd., with effect from March 11.

Mr. Cormack was elected to the board of the British Company in 1937 and became managing director in 1946, a post which he held until 1956, continuing since then, at the request of Mr. Heinz, as a member of the board.

Obituary

The death occurred on March 14, after a long illness, of MR. GEORGE WOOD, C.B.E., vice-president of Thos. W. Ward, Ltd. A native of Sheffield, he was educated at Sheffield Technical Day School and joined the company as a boy in 1897. He was appointed local director in 1919, director in 1923, and chairman in 1950. An expert on iron and steel scrap and shipbreaking, he was Director of Scrap Iron and Steel Supplies in the early days of the war. He leaves a widow and a son.

*

MR. JOHN C. SWORD, chairman of Crimpy Crisps, Ltd., died on Sunday, March 27.

He was a man of immense and varied interests. In 1919 he bought a bus and built this up into one of the largest bus services in the West of Scotland. Running parallel with this he developed air lines, baking interests, farming, potato crisps, and garages. His collection of veteran cars is the largest private collection in the world, containing over 260 veteran cars.

His other hobbies included a very large collection of antique clocks, together with a varied and interesting collection of paintings.

Mr. Sword was born in Airdrie, Scotland, of which town he was recently made a Freeman, and was a well-known and much-loved man He leaves four sons and one daughter.

MR. G. F. PIERCE, aged 49, has been appointed the sales director of Kraft Foods, Ltd. He joined the company in 1933 as a clerk in the sales department, and has been publicity manager, merchandising manager, and responsible for sales training before becoming sales manager in 1957. During the war he was commissioned in the Royal Artillery. He was injured in a car smash on the way to Normandy which kept him two years in hospital.

Mr. Pierce lives at Ealing with his wife, and daughter, aged 16, and in his spare time likes a game of cricket, and fishing.

■

The following appointments in major subsidiary companies of the Beecham Group took effect on April 1. MR. J. WHITEHOUSE, formerly sales director, Thomas and Evans, Ltd., becomes northern regional director of Thomas and Evans, Ltd., based on Leeds.

MR. B. F. KINGSTON relinquishes his appointment as marketing director, Beecham Foods, Ltd., to becomes sales director, Thomas and Evans, Ltd.

MR. L. C. DEANE, formerly a divisional manager and director of Beecham Overseas Ltd., succeeds Mr. Kingston as marketing director, Beecham Foods, Ltd.

■

MR. DAVID NEILSON ROBERTSON has retired as Chairman of James Robertson and Sons (Preserve Manufacturers) Ltd., after 23 active and successful years in that position, having been with the firm for 50 years.

His successor will be MR. JAMES ROBERTSON WEIR, a grandson of the founder of the company. Mr. Weir has been with the firm for 39 years and has been managing director of the Paisley factory for 25 years.

In addition to this change, there have been four Board appointments, which took effect from April 1. For the the first time in the history of the company, directors have been appointed who are not members of the Robertson family.

Three of these new directors have been with the company for many years, occupying senior executive positions. They are: MR. ROBERT ADAM, office manager of the Paisley factory, who has been with the company for 37 years; MR. ALEXANDER G. CHIRREY, works manager of the Manchester factory, who has been with the company for 47 years; and MR. HAROLD LESLIE WATSON, sales manager of the London factory, who has been with the company for 38 years.

Mr. Adam has also been appointed Secretary of the Company.

The fourth director is MR. JAMES BLAKEY, F.C.A., a past president of the Institute of Chartered Accountants.

■

MR. T. M. LOUDON, who was appointed Director of Economic Co-ordination in the East Africa High Commission, Nairobi, in 1955, has been attached to H. M. Embassy, Washington.

He will be concerned with coffee matters, and in particular with the International Coffee Study Group, which was established in 1958, with headquarters in Washington.

Mr. Loudon, who was born in 1910, was appointed to the Colonial Administrative Service in 1946, and joined the East Africa High Commission in 1952. Before the war, he had travelled extensively in Latin America on business connected with coffee.

*

For health reasons MR. E. A. S. ALEXANDER has relinquished the post of deputy chairman of United Glass, Ltd., and also his executive duties. Mr. Alexander will, however, retain his seat on the Board.

*

MR. KENDALL D. DOBLE, JR., has been elected president of the Pneumatic Scale Corporation, Ltd., of Quincy, Mass. He succeeds his father, who died recently. He joined the company in 1952 and became Vice President in 1955.

■

MR. J. F. M. JAMES has been appointed assistant to Mr. J. Denny, sales director of E. M. Denny and Co., Ltd., 102, Dean Street, W.1.

He will be responsible for directing the considerably increased output of canned meats which the Company are selling. A graduate of Leeds University, he is 37 and served with the Royal Navy during the war.

*

MR. A. J. C. HOSKYNS-ABRAHALL, chairman of Van den Berghs and Jurgens, Ltd., has been elected president of the Margarine Manufacturers' Association in succession to Mr. Geo. Walker, joint managing director of Western Margarine Ltd.

MR. A. C. LAUGHTON, chairman and managing director of the Peerless Refining Co. (Liverpool), Ltd., was elected president of the Association of Manufacturers of Shortening and Compound in succession to Mr. Alan A. Pratt, O.B.E., chairman of The Southern Oil Co., Ltd.

■

The following changes have been made in senior appointments in the Board of Trade, with effect from March 21: MR. G. H. ANDREW, C.B., at present Second Secretary (General) will become Second Secretary (Overseas) in succession to SIR EDGAR COHEN.

MR. J. LECKIE, C.B., will become Second Secretary (General) in succession to Mr. Andrew.

Sir Edgar Cohen has been appointed Head of the U.K. Permanent Delegation to the European Free Trade Association and the General Agreement on Tariffs and Trade.

Erections and Extensions

T. Wall and Sons, Ltd., are having a food distribution depot built on a site at Queen Margarets Road, Scarborough, Yorks.

*

Whitelocks, Ltd., cheese factors, are having a warehouse built at Yarm Road, Stockton-on-Tees, Co. Durham.

■

G. A. Gray, Ltd., mineral water manufacturers, are extending their factory in Low Grange Road, Spennymore, Co. Durham.

■

Courage and Barclay, Ltd., brewers, are having a new bottling factory built at Park Street, Southwark, London, S.E.1.

*

Ulster Farmers' Bacon Co. (Newry), Ltd., are having a bacon factory constructed at Lisdrumgullion, Newry, Co. Down, N. Ireland, at an estimated cost of £250,000.

*

John Trent, Ltd., are having a bakery built on a 65,000 sq. ft. site at Mill Lane, Alton, Hampshire.

■

B. and R. B. Burtt, Ltd., are having premises at Laughton's Farm, Hougham, Grantham, Lincs., converted into a food packaging factory.

*

Allied Bakeries, Ltd., are proceeding with plans for the erection of a bakery on a 4-acre site at Whitton White House Industrial Estate, Ipswich, Suffolk.

■

Hunters the Bakers, Ltd., are having extensions erected to their bakery on the Team Valley Trading Estate, Gateshead, Co. Durham, at a cost of £180,000.

*

Newcastle Breweries, Ltd., are having factory premises in Bath Lane Terrace, Newcastle-on-Tyne, converted into a bonded store, warehouse, canteen and office accommodation.

*

The Sansinena Co., Ltd., have opened a new distribution depot for canned foods, meat and poultry at Rye Lane, Station Road, Dunton Green, Kent, under the managership of Mr. E. A. Williams

Food News Overseas

ANUGA 1961

The General Exhibition of Fine Foods and Provisions known as ANUGA 1961, will be held in Cologne from September 23 to October 1, 1961. After the successful conclusion of the ANUGA 1959, in Cologne, more than 95% of the participating exhibitors of the fine food and provisions branch declared their intention during the option period to display their goods again at the ANUGA 1961, in Cologne. The constantly growing demand for exhibition space will be met by a considerable expansion of the halls by approximately 7,000 sq. metres so that a total of 100,000 sq. metres of display area will be at the disposal of the ANUGA 1961.

Uganda now self-sufficient in sugar

Uganda's sugar production is now sufficient to meet her own requirements and leave a sizeable surplus for export. Reporting this from Entebbe, Barclays Bank D.C.O. adds that, as a result, the levy of 11s. per ton imposed in 1957 to pay for storage of reserve supplies of sugar has virtually been abolished, being reduced to a nominal 2 cents per ton.

Russia buys Dutch milk plant

N. V. Apparatenfabriek Stork and Co., of Amsterdam, has received from a milk factory near Moscow a 1,300,000 guilder order for equipment with a capacity of 100,000 litres (22,000 imp. gal.) of sterilised milk a day. The plant will be opened next summer.

A similar milk factory with a capacity of 150,000 litres (33,000 imp. gal.) of sterilised milk a day will be supplied to Iran. The factory will be erected in the oil centre of Abadan and produce butter and cheese by-products.

Jamaica and Trinidad's 1960 sugar estimates

According to a Barclays Bank D.C.O. report from Kingston, Jamaica, the latest estimate of the island's 1960 sugar production is 412,000 tons. By March 19, 140,218 tons of sugar had been manufactured for the 1960 crop, of which 58,238 tons were shipped to the United Kingdom and 9,956 tons to Canada.

The Bank also reports from Trinidad that the latest estimate for Trinidad sugar production in 1960 is 188,100 tons. This represents an increase of some 1,500 tons on the February estimate.

Another Philippine flour mill

A contract valued at $1 million has been placed with Thomas Robinson and Sons, Ltd., by Liberty Flour Mills, Inc., of Manila. The contract calls for the erection and equipping of a complete flour mill with a capacity of 200 tons in 24 hours.

Robinsons were awarded the contract for the first flour mill in the Philippines some two years ago, by Republic Flour Mills, Inc. The Liberty mill will be sited on the Pasig River, near Manila, only some 200 yards from the site of the Republic mill. It will incorporate machinery of the most modern design, manufactured in the Robinson factories at Rochdale, and conveying of stock through the various processes will be almost entirely by means of the Robinson *Pneu-Flow* pneumatic conveying system. A central control panel will give visual control of the flow of wheat from the silos, through the wheat cleaning department, to the mill, and modern packing machinery will ensure the speedy handling of the finished products.

Japanese cut-price flour

Japanese exporters are reported to be taking advantage of low Japanese milling costs and freight rates to undersell Australian flour on a number of Australia's traditional markets in South East Asia. It is reported that, as a result of favourable charter rates for bulk cargoes from Australia, Japanese millers are buying large quantities of Australian wheat. After milling it they are able to ship the flour to Thailand, Malaya and Singapore at prices well below those of flour milled and shipped direct from Australia.

Intense competition on shipping lines plying between Japan and South East Asian ports gives the Japanese exports a further advantage. The first Japanese breakthrough is reported to have been on the market of Thailand. Thailand's normal imports of Australian flour have already been cut by 20%, but it would appear that no significant gains have so far been made in Singapore and Malaya. However, flour from Japan is being offered freely for sale there in calico bags marked to indicate that the flour has been milled from the finest Australian wheat.

"Gentlemen . . . Smelton's Baby Food!"

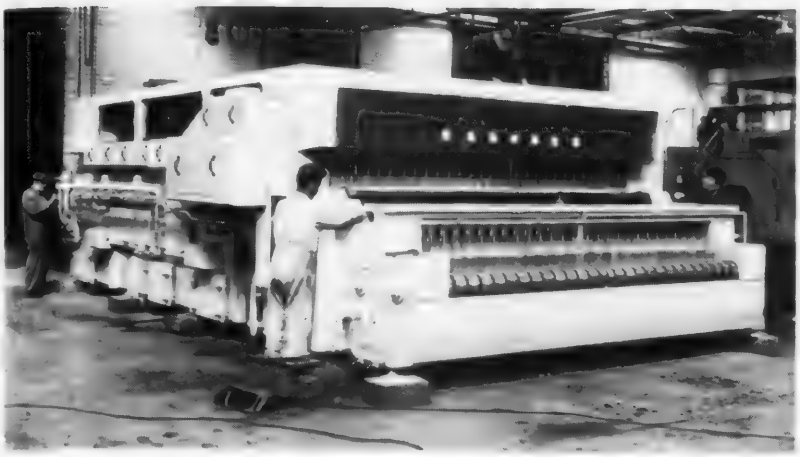
Powdered milk in Dominican Republic

A new departure for the Dominican dairy industry is the manufacture of *Bambi* powdered milk by Industrial Lechera, C. por A. This firm already uses a large proportion of the Dominican Republic's milk production.

The powdered milk is on sale in waterproof packets, proof against humidity, made of polythene, in several sizes and at prices below that of imported powdered milks. The milk is also packed in cases of 100 lb. for industrial purposes. It is said to be of better quality than imported milks of its type because it is manufactured according to a special process which leaves an average fat content of 28%. The milk is sterilised for three seconds at 130°C. for an hour and then spray dried at a pressure of 3,000 p.s.i. Here it is changed to powder at 65°C. and falls into the lower part of the chamber where it remains at this temperature for 16 hours before being extracted to a packing unit which fills 100 lb. crates.

Canadian conference on food quality

The third annual conference on food quality will be held on June 9 and 10 at the Royal Alexandra Hotel, Winnipeg, Manitoba, Canada. The conference is sponsored by the Canadian Institute of Food Technology and prominent members of the Canadian food industry will speak. The programme will include a session on the latest technological developments. Full details may be obtained from Mr. A. G. McLeod, Manitoba Department of Health, 320 Sherbrook Street, Winnipeg 2, Manitoba.



During the forthcoming Olympic Games to be held in Rome it is anticipated that milk consumption will be increased by many hundreds of thousands of gallons. To meet this situation and quench the thirst of visitors and athletes alike, an already well-advanced dairy modernisation programme is being stepped-up. A major item in the new equipment being purchased is a fully automatic soaker hydro bottle washer made by Dawson Bros. Ltd. This new machine which will handle up to 18,000 bottles per hour has been appropriately christened the Olympic.

The bottles are automatically fed into the machine and carried through a prolonged soaking and jetting treatment before being automatically discharged on to a conveyor which carries them to the filling and capping machines. The illustration shows the machine receiving the final touches before being shipped to its destination, which is the Centrale Comunale Del Latte in Rome.

New Russian sugar refinery

Another big sugar refinery has been put into operation in the Kuban area of the Krasnodar territory of the R.S.F.S.R. (U.S.S.R.—the tenth in the territory in the past 18 months. Each of them has a daily capacity of 2,500 tons of beet sugar. The refineries were built in 18-27 months, as compared to the 3-4 years required for the construction of smaller plants previously.

Sugar production in the Kuban area in 1959 totalled 224,000 tons—three times the 1958 figure. It is expected that this year 550,000 tons will be produced.

Opportunities for frozen juice in Australia

Development of a large-scale Australian market in the production of frozen citrus juice concentrates is one of the prospective opportunities for industrial investment in the State of Victoria, reports a survey prepared for the Victoria Promotion Committee by the Stanford Research Institute of California. It finds that the frozen juice concentrate is still virtually unknown in Australia. There is only one producer, whose output is limited, and only ten producing citrus-fruit juice in other forms.

Yet, says the survey, there are good reasons to believe that a market for frozen juice concentrates, particularly orange juice, could be readily developed in Australia, judging by American post-war experience. Introduction of the product would also be in line with the Australian trend towards a wider use of frozen foods——production of quick-frozen vegetables rose from 2·4 m. lb. in 1954/55 to 13·2 m. lb. in 1958/59.

Danish Food Fair

The Danish Food Fair, 1960, will be held in Aalborg from June 3 to 12. This event will be the first of its kind in Denmark, and is intended to be an annual occasion from now on. The fair is supported by the Danish Government and by all the national associations of food producers.

Philippines to barter sugar for U.S. tobacco?

The Philippines is considering a move that would, in effect, mean trading its sugar for U.S. tobacco. Congress has before it a Bill that would relax import restrictions on U.S. tobacco, in the hope that this would pave the way for a larger Philippine quota in the U.S. sugar market.

The Philippines is seeking a quota increase of 300,000 short tons, which would give the country an added annual income of over $50 million a year.

OBITER DICTA

● To eat a fried egg for breakfast is almost like putting a little hot-water bottle inside you.—*Egg Marketing Board advert.*

● "We want," the Mayor of Cheltenham is reported as saying, "to destroy the legend that Cheltenham is all curry and colonels."—*The Times.*

● At the end of the day Mr. Buchanan remarked that the prospect of a 40 ft. high illuminated bottle of beer "takes some swallowing."—*The Times.*

● The dinner table is the best reminder of one's lost youth. I can no more eat what I like. I must only nibble what I must.—*Mr. Somerset Maugham, quoted in the Sunday Times.*

● A gift always in good taste, according to National Live Stock and Meat Board, is a gift-wrapped meat item. Unlike the more liquid gift, this one can be enjoyed by every member of the family.—*Food Processing.*

● "Left wing sentiments in broken English"—a description of Burns's poetry overheard at yesterday's party given by Arthur Bell, the distillers, and Baxters, the haggis makers, to celebrate the 201st anniversary of the poet's birth. — *Peterborough in Daily Telegraph.*

● The only consolation one can seek when one considers the word "breathalyzer" is that this device could so easily have been called a TIPSEE (Tester Indicating Percentage Saturation of Exhaled Ethanol), so maybe things are not quite as bad as they seem.—*Letter in Daily Telegraph.*

● The shopkeeper should thoroughly rap all cakes before selling them to make sure all disease is eliminated.

Food should not be picked up by the hand but with tongues.

Food should be kept covered in shops because of the diseased types who buy it.

Student nurses' examination answers quoted in British Medical Journal.

● We live in England on a most unhealthy musical diet, with vast helpings of heavy orchestral fare, rich in fats and carbohydrates, almost no chamber music (protein) and little music of any sort composed during the last forty years (*i.e.* those salubrious but somewhat forbidding green salads).—*Sunday Times.*

Trade Marks

M & D POTATO SNAX.—785,414. Potato crisps. **Meredith and Drew, Ltd.,** Murray House, Barbican, London, E.C.1.

DITABLE.—787,898. Edible oils and edible fats. **Fabrique de Margarine MEA,** 10, Rue de Lambusart, Fleurus, Belgium.

FAIRY WAND.—792,974. All goods included in Class 29. **Fruitin, Ltd.,** 35, Piazza Chambers, Covent Garden, London, W.C.2.

CHAM.—B793,323. Canned meats. **Tyne Brand Products, Ltd.,** Fish Quay, North Shields, Northumberland.

RENATA.—794,314. Preserved, dried and cooked fruits and vegetables; and tomato paste. **La Conserviera Meridionale S.p.A.,** 40, Via Medina, Naples, Italy.

TASTE THEM ENJOY THEM.—795,554. Sausages, black puddings, canned meats, preserved meats, canned soups, fish pastes, meat pastes, lard (for food) and dripping (for food), all for sale in England, Scotland and Wales and for export. **T. Wall and Sons, Ltd.,** "The Friary," Friar's Place Lane, Acton, London, W.3.

NU-KREVOL.—796,014. Imitation cream for food. **Bendon Products, Ltd.,** 51, Bendon Valley, London, S.W.18.

OCEAN BOY.—796,397. Canned fish. **Dehn and Co., Inc.,** 559, Colman Building, Seattle 4, State of Washington, United States of America.

SWIZZELS MOTTOMINTS. — 782,481. Non-medicated confectionery flavoured with mint. **Swizzels, Ltd.,** Carlton House, New Mills, near Stockport, Cheshire.

SLENDABIX.—B791,580. Cakes, biscuits (other than biscuits for animals) and rusks. **Smarius Koekfabrieken N.V.,** Goirkestraat 143, Tilburg, Holland.

ESKIMO.—793,437. All goods included in Class 30, but not including ice cream, ice cream powder or chocolate, or any goods of the same description as any of these excluded goods. **Eskimo Foods, Ltd.,** East Side, Royal Dock, Grimsby, Lincolnshire.

SCOTTISH PIPER.—B794,030. Biscuits (other than biscuits for animals) and small cakes. **Thomas Tunnock, Ltd.,** 43, Main Street, Uddingston, near Glasgow.

TASTE THEM ENJOY THEM.—795,555. Meat pies and canned meat puddings, all for sale in England, Scotland and Wales and for export. **T. Wall and Sons, Ltd.,** "The Friary," Friar's Place Lane, Acton, London, W.3.

PEPPERIDGE FARM.—796,252. Biscuits (other than biscuits for animals), bread, cakes, muffins, pastries, pies, rolls (bread), stuffing (unfrozen) being a mixture of dried bread and seasoning, bread crumbs, wafers (biscuits) and melba toast. **Pepperidge Farm, Inc.,** Norwalk, Fairfield County, State of Connecticut, United States of America.

ORYX BRAND.—789,396. Tinned and preserved meats. **Damara Meat Packers, Ltd.,** Continental Buildings, Kaiser Street, Windhoek, South West Africa.

SOFRIT.—794,481. Food preparations in powder form made principally of dehydrated vegetables. **Productos Riera, S.A. "P.R.I.S.A.,"** Ronda Universidad, 9, Barcelona, Spain.

H.S. BRAND BUTTERED KIPPER FILLETS.—B792,565. Buttered kipper fillets and kippers. **Percy William Sutton** and **Cyril Edward Sutton,** South Denes Road, Great Yarmouth.

DINGLEY DELL.—794,822. All goods included in Class 29. **Charles Dickins, Ltd.,** 18, Ambrose Street, Cheltenham.

CALMEX.—797,561. Canned fish. **Wilbur-Ellis Company,** 320, California Street, San Francisco 4, State of California, U.S.A.

GREEN STAR.—778,224. All goods included in Class 30, but not including baking powder, isinglass, tea or cereals for use as food or any goods of the same description as any of these excluded goods. **H. and O. (Retail), Ltd.,** 179-189, City Road, London, E.C.1.

PENNYWELL. 788,033. All goods included in Class 30. **W. Fiddes and Co., Ltd.,** 139, Pennywell Road, Bristol, 5.

POPPATINES.—790,368. All goods included in Class 30. **Meredith and Drew, Ltd.,** Murray House, Barbican, London, E.C.1.

TRUFFINA.—B790,382. Cocoa, chocolate and non-medicated sugar confectionery. **Chocoladefabriken Lindt and Sprüngli Aktiengesellschaft,** Seestrasse 204, Kilchberg-Zurich, Switzerland.

Recent Patents

COMPLETE SPECIFICATIONS ACCEPTED

831,306. BRITISH SOYA PRODUCTS, LTD.: Processes for the production of baker's dough.

831,521. B. BISINGER: Hopper feeder for fibrous materials.

831,607. R. G. POINSARD: Electro-mechanical treatment liquids, particularly fermented drinks.

831,310. FARBWERKE HOECHST AKTIENGESELLSCHAFT VORM. MEISTER, LUCIUS AND BRÜNING: Method of packing liquid or pasty goods in hard foils of artificial thermoplastic material.

831,536. J. H. EMERSON: Food or drink containers.

831,797. A. SCHMIDT-BURBACH: Process of preparing milk products such as sour milk by use of starter cultures.

831,498. O. ROALD: Container for storing and dispensing pulverulent materials such as salt, pepper or the like.

831,365. R. FRIESS: Machine for chopping or mincing meat, foodstuffs or the like.

832,343. T. FRUS-ANDERSENS: Manufacture of chocolate.

831,958. K. NEUBAUER: Dough-kneading machines.

832,376. G. W. HORNER AND CO., LTD.: Methods of and apparatus for the continuous production of toffee, caramel or like sweetstuffs.

832,377. T. HEDLEY AND CO., LTD.: Manufacture of margarine.

832,539. J. MASEK, J. HASKOVEE and M. VEDLICH: Ripening of cream.

832,407. LILY CUPS OVERSEAS, LTD.: Nestable containers.

832,449. DOW CHEMICAL CO.: Composition and method for coating foodstuffs and articles thereby obtained.

833,422. NATIONAL RESEARCH DEVELOPMENT CORPORATION: Removal of small imperfections or foreign bodies from edible materials.

833,330. A. EVANS: Treatment of fried foods.

833,213. CLARNICO, LTD.: Manufacture of confections, such as cream fondants.

833,214. CLARNICO, LTD.: Removal of articles, such as confections, from rubber moulds.

833,373. WRIGHT HARGREAVES ENGINEERING CO., LTD.: Apparatus for inverting milk churns and other cylindrical articles.

833,100. A. BALLARINI, C. BALLARINI and E. BALLARINI: Devices for the preparation of infusions, especially coffee infusions.

833,116. J. G. ROBERTS: Production of butter-like spread.

832,881. A. G. GETREIDEFLOCKEN: Process for the production of foodstuff flakes.

832,901. DCA FOOD INDUSTRIES, INC.: Apparatus for the production of fried cakes and the like.

833,682. J. W. REYNOLDS: Refrigerating systems.

New patents are from the Journal of Patents and new trade marks are from the Trade Marks Journal. In each case permission to publish has been given by the Controller of Her Majesty's Stationery Office. Each of the publications is obtainable from the Patents Office, 25, Southampton Buildings, London, W.C.2.

New Companies

Park Lane Sauces, Ltd. (645811.) 25a, Cockspur Street, London, S.W.1. To carry on bus. of mnfrs. of and dlrs. in foods of all kinds, etc. £100. Dirs.: R. E. Bunzly and G. M. Colombi.

Seawax Packed Foods, Ltd. (646040.) Poplar Farm, Waxham, Sea Palling, Norwich. £1,000. Dirs.: L. M. and Mrs. M. M. Watney.

Slimcea, Ltd. (645979.) 47, Dean Street, London, W.1. To carry on the bus. of mnfrs. of and dlrs. in bread, flour, etc. £500. Dirs.: D. W. Kent-Jones, H. P. Maybury, H. F. Redway and Wm. H. White.

Soft Ice Machine Co., Ltd. (647181.) Mnfrs. of and dlrs. in ice cream machinery, etc. £100. Subs.: Terence M. Hillman, Shirley M. Gillan and Leslie Toye.

Morris, Corfield and Co., Ltd. (647325.) Smithfield Works, Smithfield Road, Much Wenlock, Salop. Agricultural engineers. £10,000. Dirs.: Leslie P. Morris, Richard J. Corfield and Thomas A. C. Brereton.

R. Miller and Son (Food Machines), Ltd. (647330.) 5, Chestnut Close, Buckhurst Hill, Essex. Butchers' engineers, mnfrs. of and dlrs. in plant, machinery, etc. £2,000. Permt. dirs.: Ralph A. Miller and Henry R. Miller.

Yankee Corn Products, Ltd. (647394.) 67, Newhall Street, Birmingham, 3. To carry on the bus. of mnfrs. of and dlrs. in confectionery, etc. £200. Dirs.: Frank Banister and Mrs. Doris Banister.

Bland Refrigeration Co., Ltd. (647404.) Hermitage Works, Church Terrace, Red Lion Street, Richmond, Surrey. £5,000. Dirs.: Gerald C. S. G. Bland and Phyllis Bland.

Frank Roberts of Midlands, Ltd. (647419.) 72, Watling Street, E.C.4. To carry on bus. of importers, canners, packers of and dlrs. in and agents for the sale of fruit, vegetables, meat, poultry, game, fish, etc. £1,000. Dirs.: Frank M. Roberts and Percy N. Hemming.

Pitel-Lo, Ltd. (647447.) To carry on the bus. of importers, exporters, mnfrs. of and dlrs. in alcoholic beverages, soft drinks, mineral and aerated waters; brewers, distillers, etc. £1,000. Dirs.: Wm. H. Whitaker, John R. Clough, Edward R. Coleman and Ronald Cowburn.

These particulars of new companies recently registered have been extracted from the daily register of Jordan and Sons, Ltd., Company Registration Agents, 116, Chancery Lane, London, W.C.2.

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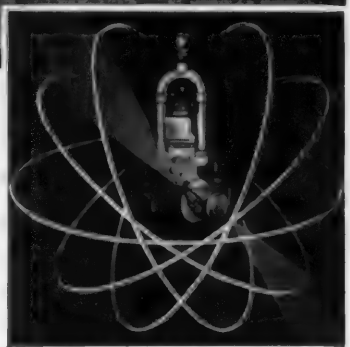

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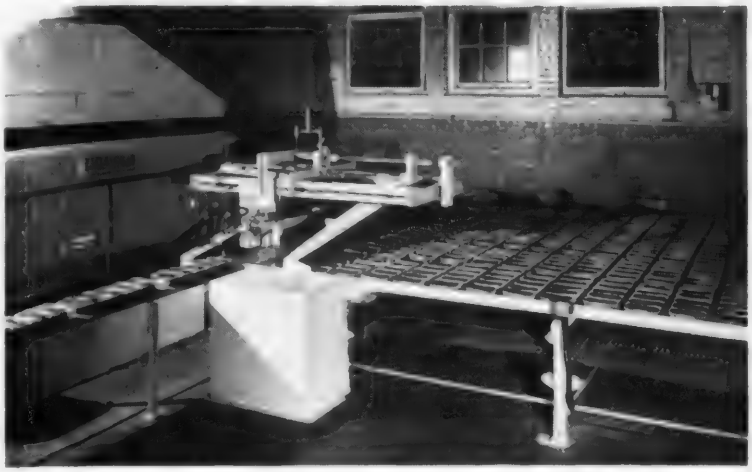

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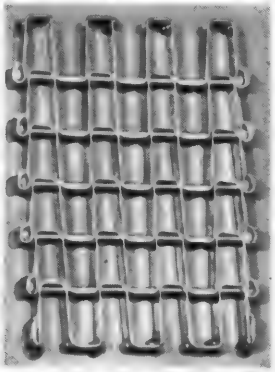

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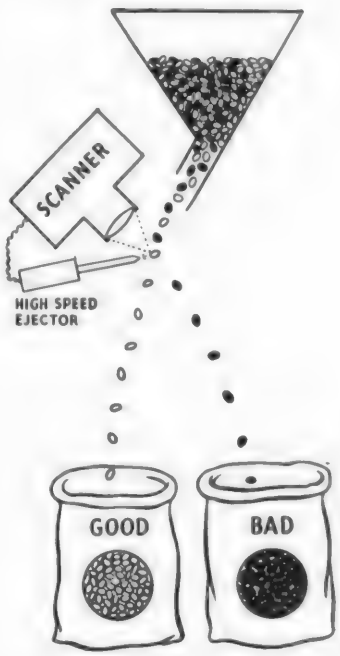

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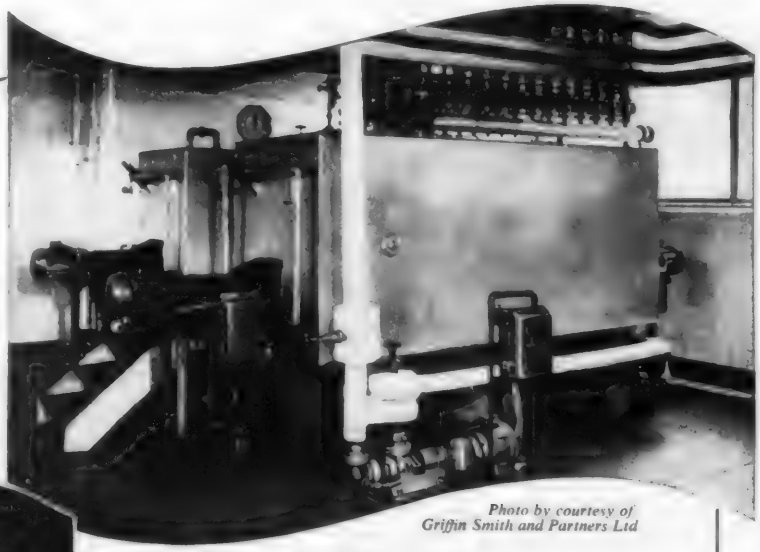

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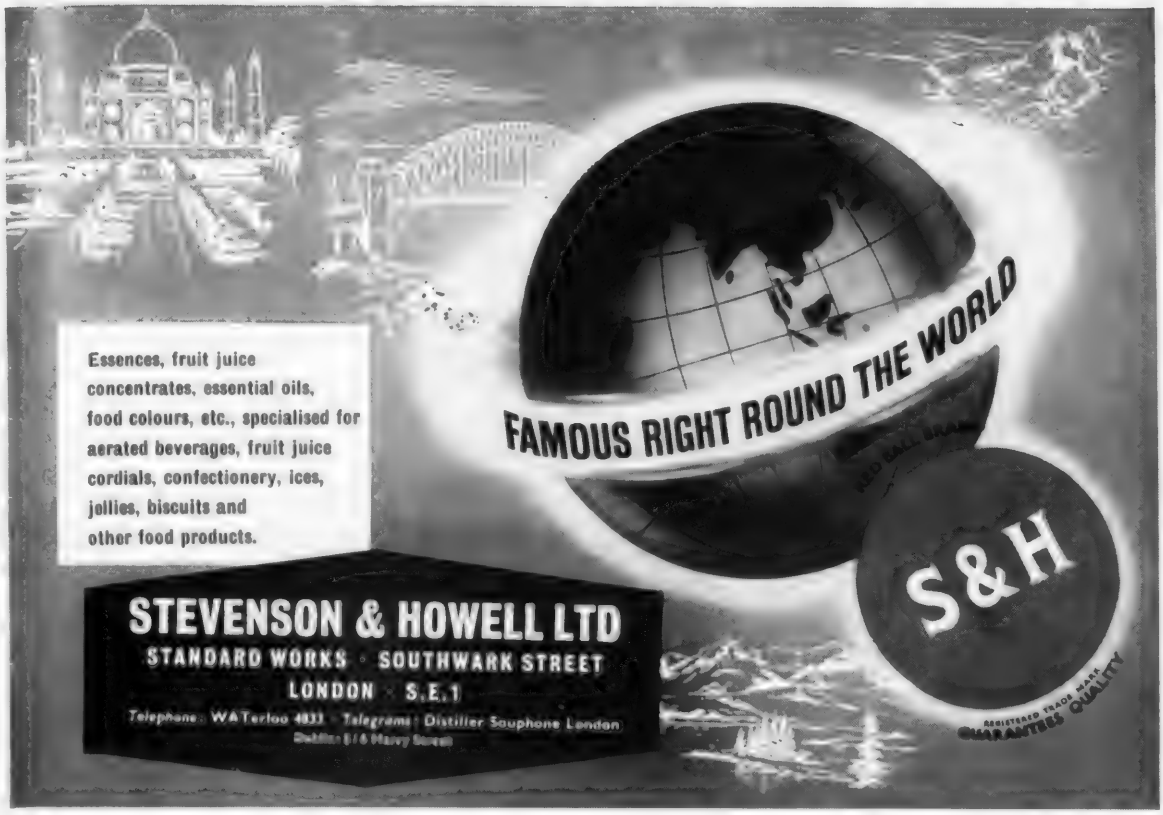
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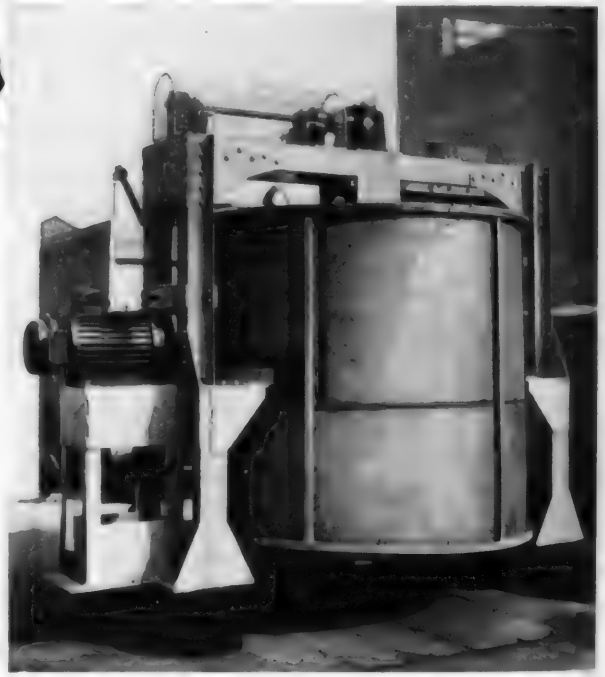

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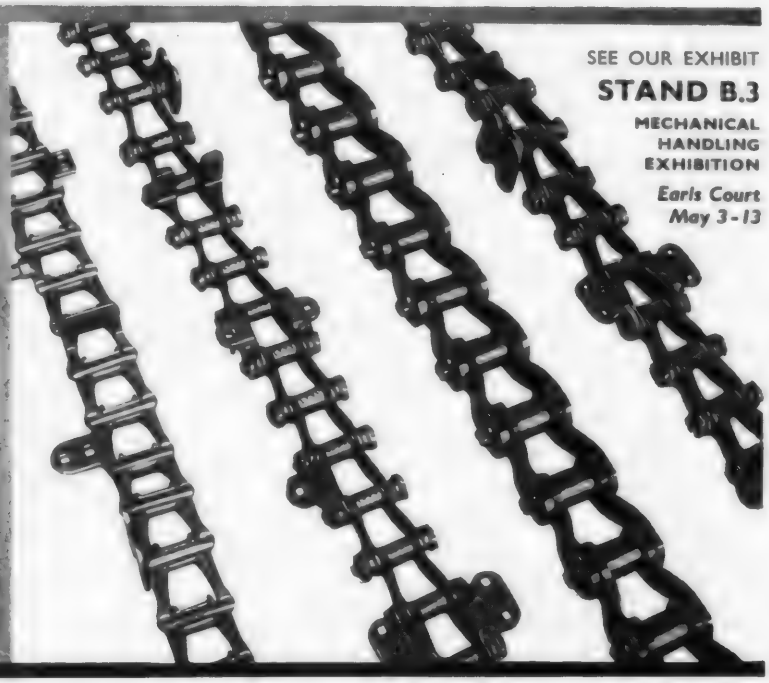

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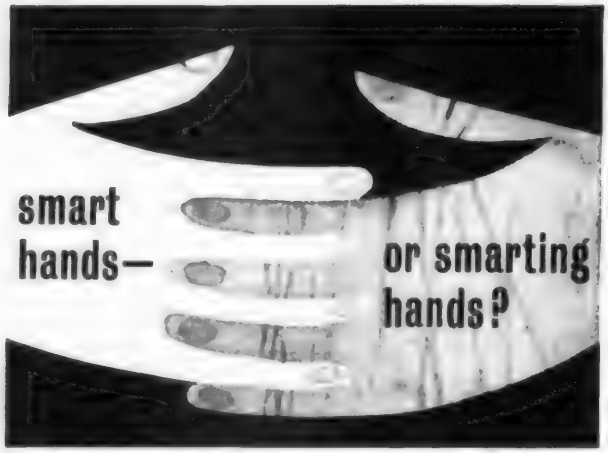

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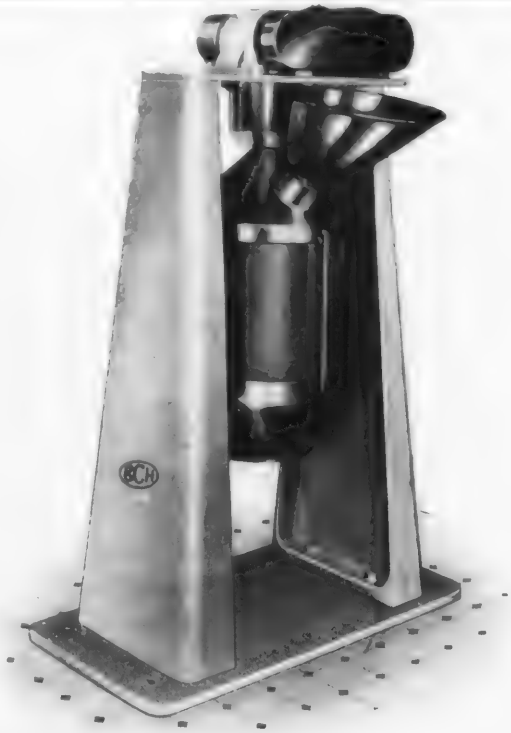

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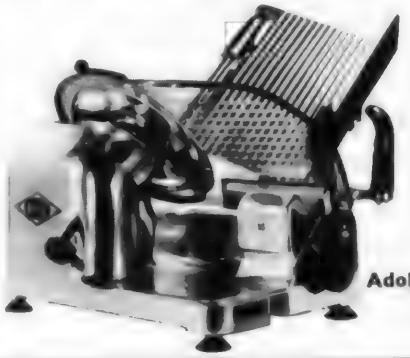

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I.S.I.S. is an organisation backed by a large industrial group of consultants with contacts in all the industries based on technology. As an addition to their present resources they have established this Appointments Register. Below will be found some of those technologists who are looking for further opportunities. Employers and Personnel Officers are invited to complete the form below, detach and send to the above address. In this particular instance the use of a form, with its attendant simplification of office systems, ensures speedier results for the employer.

Ref. A.236. British. Male. Single. Age 26. City and Guilds Cert. (Milk Processing and Control). N.D.D.T. 1 year experience Cheesemaking (factory). Practical factory experience in Buttermaking, Spray Dried Milk, Pasteurisation and Bottling. At present Assistant Regional Officer, engaged in administration and advisory work involving daily visits to farms and milk depots. Requires any suitable post in Dairying, U.K. Salary £800 p.a.

Ref. A.237. British. Male. Married. Age 26. A.I.M. 2 years Liaison Metallurgist, special steel makers. 5½ years Metallurgical Chemist and Metallurgist, cast iron, non-ferrous founder and engineer. At present Assistant Divisional Metallurgist, electrical supply industry. Seeks post as Metallurgist, general rather than specialised, Southern England. Salary £1,100 p.a., approx.

Ref. A.238. British. Male. Single. Age 42. Inter B.Sc. Assoc. I.E.E. 7 years Development Engineer, telecommunications. 7 years Development Engineer, Radio valve manufacturers. Seeks appointment U.K. or abroad as Sales Engineer. Salary £1,200p.a.

Ref. A.239. British. Male. Single. Age 26. B.Sc. (Zoology) F.R.E.S., M.I. (Biol.). At present Entomologist and Technical Adviser, insecticides, carried out biological research in U.K. and chemical research and pilot plant operation in Kenya. Seeks post in Entomological Research or as Management Trainee or Personnel Trainee, U.K. Salary £1,000 p.a.

Ref. A.240. British. Male. Married. Age 55. B.Sc. (Eng.). Trained Safety Officer. Experience: 10 years Ministry and War Office, Inspection, Experiment and Research. 1½ years Senior Design Officer, Ministry of Supply. 5 years Superintendent of Development, Ordnance factories, India. 6½ years Resident Engineer (Mech. and Elec.), electrical power generation, mainly steam, some diesel. 1 year Assistant to Managing Director, factory extension plant layout and services work. 3 years Area Manager, construction works, chemical industry and refinery construction. Seeks Executive/Administrative/Works Management/Works Maintenance or Personnel Appointment. Salary £1,450-£1,500 p.a.

Ref. A.241. British. Male. Married. Age 36. O.N.C. and H.N.C. (Mech.Eng'g.). A.M.I.Mech.E. 7 years apprentice and Development Engineer, motor and aircraft equipment. 3½ years Engineering Draughtsman, commercial vehicle bodywork and hydraulic equipment. 9 years Engineer with Civil Service responsible for major engineering projects involving light to medium products. Seeks Project Management post in this field. London or Home Counties.

Ref. A.243. British. Male. Married. Age 47. B.Sc. (Physics). F.Inst.P. Member Soc. Instrument Technology. 3 years Physicist, smokeless fuel manufacturer. 3 years Research Physicist, cocoa and chocolate manufacturer. 6 years Experimental Work, Admiralty. 11 years Head of Research, instrument manufacturers. Interests are industrial physics, instruments, analytical instruments. Seeks post as Laboratory or Development Manager, U.K. (London preferred), or abroad. Salary £2,000 p.a.

Ref. A.244. British. Married. Age 47. Male. Ing. Agr. (equiv. B.Sc.[Agr.]). 14 years Bacteriologist, research and development. At present Bacteriologist, antibiotics. Linguist—8 languages and quite familiar with scientific translation work, organic, inorganic and biochemistry. Seeks post as Bacteriologist, London or Provinces. £1,500 p.a.

Ref. A.245. British. Male. Married. Age 42. A.M.I.Mech.E. 1 year Design Draughtsman, mechanical handling. 4 years O.C. Divisional Workshops, H.M. Forces. 3 years Project Engineer, air conditioning, heating and ventilating, and 2 years Head of Export Section. 4 years Works Engineer, explosives manufacturer, 3 years Deputy Works Engineer, rayon manufacturer. At present Chief Engineer, rayon manufacturers. Seeks post London Provinces or abroad (except the East and Africa). Salary £3,000/£4,000 p.a.

Ref. A.247. British. Male. Single. Age 26. B.Sc. (Botany). Ancillaries: Organic Chem., Bacteriology, Zoology. At present Microbiologist—research in antibiotics. Seeks post as Microbiologist, or interested in openings into the more commercial (e.g. technical sales) side of the biochemical, pharmaceutical or chemical industry. London or S. England, Salary £1,000 p.a.

Ref. A.248. British. Male. Married. Age 29. H.N.C., G.I.Mech.E. 6 years apprenticeship to Development Engineer, scientific instruments. 3½ years Design Engineer, aero engines, 8 months Mechanical Engineer, wind tunnels. 6 months Consultant, high speed pumps. Seeks post as Mechanical Engineer, S. England, Canada, U.S.A., Australia. Salary £1,200.

Ref. A.250. British. Male. Married. Age 36. B.Sc. (Chem., Physics, Maths.). 4½ years Experimental Assistant, chemical inspection. 4 years Laboratory Assistant, research—solvent extraction. At present in charge Biochemical Laboratory, research and development in antibiotics. Seeks post as Analyst or Research Chemist. London or Surrey. Salary £1,350 p.a.

Ref. A.251. British. Male. Single. Age 25. Inter. City and Guilds and Radio II. 1½ years Electrical. Engineer, overhaul of aircraft equipment. 10 months Service Engineer, cinema equipment. 3 years Engineer, i/c telecine equipment, broadcasting. Seeks post London as Electronics Engineer. Salary £800 p.a.

Ref. A.269. British. Male. Single. Age 24. Inter. B.Sc. Botany, Zoology, Chem. Subsidiaries: Agric. Bot. and Agric. Zoo. Seeks Laboratory post—preferably biological—U.K. (not London). Salary £500 p.a.

Ref. A.308. British. Male. Married. Age 24. Inter. C. & G. (Jig and Tool) Draughtsman's Diploma. 5 years Engg. Apprenticeship. 1½ years Toolmaker, at present Engg. Fitter, Coal Industry. Seeks post abroad as Engineering Draughtsman.

Ref. A.310. British. Male. Single. Age 22. B.Sc. (Special) Zoology, subsid. Botany, special subject Entomology. At present R.A.F., requires post after October 20th 1960 as Entomologist, preferably Systematic Entomology but other spheres considered. London or Provinces. Salary £800 p.a. minimum.

Ref. A.312. British. Married. Male. Age 36. B.A. and Degree in Commercial Law, M.Inst.Gen. Managers, M.Inst. Management, M.Inc.Sales Managers Assoc., A.M.Inst.Transport S.A., A.M. Inst.Personnel Management, M.Inst. of Ship Forwarding, M.Inst. of Traffic Administration, A.M. Inst. of Brit. Engrs. 2 years Senior Traffic/Admin. Officer, air transport. 2 years Commercial/General Manager airways. 2½ years Special Transport Representative, railways. 3½ years Sales Director, Trading and Transport Co. Middle East. 1½ years P.R.O. Director, building and civil engineers. 2 years Managing Director and Vice-Chairman trading/engineering Co. E. Africa. 1 year Technical and Transport Director, operating heavy transport services for oil companies. Seeks appointment requiring sound sales and general executive ability. London, U.K. or Middle or Near East, Africa, Far East or New Zealand. Salary £2,500 p.a. U.K. or £3,000 and house abroad.

Ref. A.313. Indian. Male. Single. Age 27. B.Sc. (Maths. and Physics), Part I, I.E.E. exam. 1 year apprentice, elec. branch of railway. Seeks post as Lab. Technician or Draughtsman in Electronics. London. Salary £700 p.a.

Ref. A.314. British. Male. Single. Age 28. Nat. Cert. Mech. Engg., Inter. C. & G. Prod. Engg., M.Inst.Pkg. 5 years Draughtsman, telecommunications engg. 1½ years Production Engineer, machine

continued over leaf)

To: I.S.I.S. Appointments Register, 9, Eden Street, London, N.W.1. Please ask the following applicants to communicate with the undersigned:

Ref.:.....	**Ref.:**.....	**Ref.:**.....	**Ref.:**.....
Ref.:.....	**Ref.:**.....	**Ref.:**.....	**Ref.:**.....
Ref.:.....	**Ref.:**.....	**Ref.:**.....	**Ref.:**.....

Please use Block capitals

Name: .....

Position: .....

Company: .....

Business or Profession: .....

Address: .....

All introductions are made on the understanding that should an engagement result the employer agrees to I.S.I.S. Appointments Register's terms, which are as follows:

For each person engaged the equivalent of one week's salary payable by the employer within fourteen days of the date of engagement.

Signature..... Date.....

I.S.I.S. APPOINTMENTS REGISTER (Continued from overleaf)

shop and fitting shop, machine manufacturers. 5 years Technical Representative, manufacturer of wide range of packaging materials. At present Sales Engineer with agents for Continental Packaging, Printing, bag making and confectionery machinery manufacturers. Seeks post as Technical/Sales Representative London based, prepared to travel anywhere in the world. Salary £1,300 p.a.

Ref. A.316. Dutch. Single. Age 29. Degree in Production Engineering. 1½ years Instrument Man, concrete and construction Co. (Canada). 1 year Asst. Production Engr. Cement Co. (Canada). 2 years Tool and Production Planner airline company (U.S.A.). Seeks post as Production/Methods Engineer, metalware industry. Salary £50-£70 per month. Preferably London but will consider N. England.

Ref. A.318. British. Male. Married. Age 30. 1st. Class M.O.T. Cert. of Comp. (Motor). 5 years Mechanical Engineering Apprentice, railways. At present Marine Engineer, ship owners. Seeks post as Engineer Surveyor or similar, London, S. or S.E. England or Western Australia. Salary £1,200 p.a. approx.

Ref. A.320. Indian. Male. Single. Age 29. 1st Class M.O.T. Cert. (Steam). 1st Class M.O.T. Marine Engineer. 5 years Apprentice, engineering company. 6 years Marine Engineer, shipping company. 1 year Chief Marine Engineer, shipping company. Graduate of the Institute of Marine Engineers. Seeks post as Mechanical Engineer Surveyor or Maintenance Engineer. London or Croydon area. Salary £800 p.a.

Ref. A.321. British. Single. Age 21. O.N.C. and H.N. Diploma (Mech. Engg.). 5 years engineering apprenticeship. At present Aircraft Stressman, aircraft manufacturer. Seeks post N. Rhodesia as Mechanical Engineer. Salary £800 p.a.

Ref. A.323. British. Male. Married. Age 29, A.R.I.C., A.T.I. 4 years Research Analyst and 4 years Assistant Chief Chemist, manufacturing rayon, synthetic fibres, plastics and chemicals. Experience of chromatography, polarography, amperometry, spectrophotometry methods, etc., and their application to automatic process control. Seeks post in Home Counties as Research Analyst/Application of instrumental methods of analysis to process control, etc. Salary £1,400-£1,500 p.a.

Ref. A.324. British. Male. Married. Age 28. C. & G. Inter. (Machine Shop Engg.) M.O.T. 1st Class Cert. (Steam). 4 years general apprenticeship (including drawing office), steam engineers. 6½ years Senior Officer, shipowners. Wide experience of high-pressure multi-tubular boilers, refrigeration, air-conditioning, steam turbines and boiler water treatment. A.M.I.Mar.E. Seeks post abroad or travelling or London considered as Engineer-Representative/Agent/Station Engineer/Maintenance. Salary £1,100 p.a. min.

Ref. A.325. British. Male. Married. Age 27. O.N.C., H.N.C. (Prod. Eng.) C. & G. (Eng.) Grad. I.P.E. At present Draughtsman, aero engine development. Seeks post as Assistant to Departmental Head either at Shop Floor level or Management level. Provinces, preferably Yorks/Lancs. Area. Salary £950 p.a. min.

Ref. A.326. British. Male. Married. Age 30. O.N.C. and H.N.C. (Elec. Engg.). Assoc.M. Assoc. of Supervising Elec. Engrs. 4 years Electrical Apprenticeship and Electrical Trainee. 2 years Electricity Board. 3 years Drawing Office Assistant in Electrical and Mechanical design drawing office. 6 months Technical Assistant in Sales Contract Department, manufacturer of electrical instruments. 2 years Technical Assistant in Chief Engineers Department, supervising technical details of electrification contracts. 1½ years Junior Electrical Engineer specification and plans for electrical installation and plant. At present Assistant Works Electrical Engineer with industrial manufacturing company and research laboratories. Seeks post in London as Electrical Engineer. Salary £1,100 p.a. min.

Ref. A.327. British. Male. Married. Age 24. H.N.C. (Chem. Engg.). Grad.I.Chem.E. 3½ years training as Chemical Engineer, process control, process operation and process development with oil-refining company. 6 months Chemical Engineer, atomic energy. At present Ground Radar Fitter (R.A.F. National Service). Seeks post after 1/6/60 as Chemical Engineer (preferably Research and Development). Provinces or W. Indies or Sweden. Salary £850-£900 p.a.

Ref. A.330. British. Male. Married. Age 41. H.N.C. 5 years Apprentice, General Engineers to the mining industry. 3 years Press and Machine Tool Tool Turner, manufacture of medium calibrea rms and machine tools. 3 years Tool Turner, manufacture of small arms. 5 years Die Sinker and Maintenance Turner, drop and forgeing. At present Machine Shop Foreman, manufacture of pipe flanges. Seeks post as Overseas Representative, Spain. (Good working knowledge of Spanish.) Salary £1,000 p.a. minimum.

Ref. A.331. British. Male. Married. Age 43. Engineering Apprenticeship. Grad. R.A.F. College and U.S. War College. Commercial Pilot's Licence. 22 years R.A.F. including Sqdn. Cdr., Wng. Cdr. (Admin.), Staff Officer, Test Pilot, Liaison Officer. At present Aviation Manager, aerial spraying contractors, etc. Seeks post anywhere—but Far East preferred—as Agricultural Aviation Manager, or similar. Salary £1,500-£2,000 p.a.

Ref. A.332. British. Male. Single. Age 33. O.N.C. and H.N.C. (Mech.), A.M.I.Mech.E. 6 years partner in general engineering company, maintenance and repair of engineering equipment, jobbing work and batch production of precision components. 1½ years Design Draughtsman, aircraft instrumentation, 2 years Senior Design Draughtsman, automobile manufacture. At present Design Engineer, anti-vibration mountings and suspensions. Seeks post S. England, not London, or post in New Zealand as Design or Development Engineer, Salary £1,100 p.a. min.

Ref. A.334. British. Female. Age 27. G.C.E. 'A' Level, Botany, Zoology, Geog. Qualified Teacher. 2½ years Assistant Mistress, 3 years Headmistres. (India), 3 months Headmistress (Switzerland). Seeks worthwhile biological or geographical post (non-teaching) abroad. Salary £600 p.a. minimum.

Ref. A.336. British. Male. Married. Age 61. Holds senior rank retirement commissions in all three services. Experience includes 5½ years Assistant, then Deputy Head of Special Purpose Research and Development, on original Exhaust-Driven Turbine. 4½ years Co-ordination of Research and Development—Design and Production and technical liaison with status of Chief Engineer. 4 years Technical Adviser to Boards of group of light alloy manufacturers. 9 years Head of Special Weapons Development and Production Group, Admiralty. At present Consultant or Technical Adviser to firms, U.K. and abroad, engaged in precision engineering, instrumentation and scientific apparatus manufacture, and research in applications of Nuclear or Isotopic physics. Seeks suitable technical appointment in London. "Team spirit atmosphere" much more important than salary.

Ref. A.337. British. Male. Married. Age 31. H.N.C. (Civil Engg.). A.M.I.C.E. 6 years General Civil Engineer experience, civil engineering contractors. 2 years Structural Design and Constructors, Railways. 2½ years Bridge Design and Construction, consulting engineers. Seeks post as Civil Engineer, Provinces. Salary £1,300 p.a.

Ref. A.338. British. Male. Married. Age 33. B.Sc. (Geology and Chem.). At present Assistant Regional Opencast Manager (Development), opencast coal. 13 years industrial experience, supervision drilling rigs, preparation of geological plans, estimation of quantities, compilation of reports. Seeks post as Geologist, anywhere considered. Salary £1,500 p.a.

Ref. A.339. Indian. Male. Single. Age 31. B.Sc. (Colour Chemistry and Dyeing). M.Sc., M.Soc. of Dyers and Colourists. 1st Class Dip. of C. and G. in Dyeing and Finishing. Seeks technical appointment, London or large provincial cities, or U.S.A., Switzerland, South America or Germany. Salary £1,250 p.a. min.

Ref. A.340. British. Male. Married. Age 36. 1st and 2nd Yr. Nat. Certs. (Mech.). Part I Inst. of Mech. Engrs. Passed Diploma Course in Mech. Engg. 4 years workshop training and drawing office experience. 3 years Test and Experimental Engineer, pump manufacturers. 1 year Technical Assistant, research. 4 years Technical Assistant, aero-engine manufacturers. At present Weightsman, aircraft designers and constructors. Seeks Engineering or Technical Sales appointment, London. Salary £832 p.a. min.

Ref. A.343. British. Male. Married. Age 55. Certs. in Mech. and Elect. Engg. and Metallurgy. M.Inst.Pkg., A.M.I.E.D. 5 years Draughtsman, Designer and Technical Assistant, 2 years Works Engineer, 1½ years Development Engineer and Deputy Maintenance Manager and 5 years Assistant Factory Manager, biscuit, flour and chocolate confectionery industry. 2 years Shop Manager, ordnance fillers components. 3 years Senior Methods Engineer, radio, radar and aircraft wiring, electric heating and lighting equipment. 3 years Engineer Process Designer, sugar confectionery manufacture. Seeks post in U.K. or any English speaking country abroad, as Executive in Foodstuffs, Pharmaceuticals or Light Engineering, with Production or Development bias. Salary £1,200 p.a. approx.

Ref. A.344. British. Female. Single. Age 21. G.C.E. 'A' level, Chem., Zoology and Botany. B.Sc. degree exam. in Zoology to be taken next June. Seeks post in London or S. England, preferably in a physiological or medical research laboratory, dealing with either human or animal diseases. Salary £500-£600 p.a.

Ref. A.345. British. Male. Married. Age 39. 4 years Trainee Draughtsman. 7 years Production Draughtsman, aeroplane company. 1 year Structural Draughtsman, 3½ years Trainee/Rotary Driller, oil company. 3 years Driller, oil company. 3½ years Driller, drilling company. Seeks post anywhere as Oil Well Driller.

Ref. A.346. Male. Pakistani. Age 30. B.Sc. (Military Science, Zoology and Botany). 1 year course in Electrotechnology, telephony, telegraphy and pure and applied mathematics. M.Sc. (Botany). Seeks scientific post related to research work. Salary £800 p.a.

Ref. A.347. British. Single. Age 24. Female. B.Sc. (Chem.). 1 year Technician, foundation for Experimental Biology, U.S.A. Seeks post Abroad—Europe, using chemistry but preferably not in a laboratory. Perhaps patents, etc. Knowledge of scientific French and German. Salary £650-£700 p.a.

Ref. A.348. British. Male. Married. Age 33. B.Sc. (1st Class Hons.). 3 years in charge of section of research establishment dealing with growth of pathogenic bacteria. 1 year Assistant chemist. At present Microbiologist i/c Fermentation laboratory concerned with antibiotics research. Seeks appointment, preferably in or near London, as Research or Routine Microbiologist. Salary £1,200-£1,600 p.a.

Ref. A.350. British. Male. Married. Age 40. B.Sc. (Special Chemistry). 7 years Research Chemist and Bacteriologist, food production, canning, etc. 7 years Chief Chemist and Director, Canners, food-packers, quick freezing. 7 years Fractory Manager, dehydration and canning of vegetables and fruit. Seeks post as Works Manager or Food Technologist. Manchester or London preferred. Salary £2,000 p.a. or near.

Ref. A.352. British. Male. Married. Age 38. Diploma in chemistry (inorganic and organic), analysis and chemistry of coal. A.M.I.E.T., A.F.Inst.Pet. 2 years Assistant Chemist, and 2 months Chemist in Charge, coal tar laboratory. 4 years Scientific Assistant, civil engineering and chemical laboratories. At present Assistant Chemist, water treatment laboratory. Seeks post as Chemist, U.K. (preferably Nottinghamshire), or Canada. Salary £950 p.a.

Ref. A.354. British. Male. Married. Age 46. F.R. Inst. of Chem. 12 years as Analyst, Control Chemist and Plant Manager, chemical manufacturers. 13 years Production Manager/Warehouse Manager, fine chemical manufacturers. Seeks post U.K., preferably within 50 miles radius Liverpool, as Production or Works Manager or other suitable technical appointment. Salary £2,000 approx.

Ref. A.356. British. Male. Age 30. Married. A.R.I.C.M.Soc. of Cosmetic Chemists. 1½ years Plant Manager, toiletry preparations and proprietary medicines. 2 years Manufacturing Manager, proprietary medicines and pharmaceuticals. 2 years Technical Consultant for Cosmetic Co. Seeks appointment as Technical Manager in Pharmaceutical or Cosmetic Co., London or Provinces—preferably with opportunities for travelling abroad. Salary £2,000 p.a.

Ref. A.357. British. Male. Married. Age. 42 H.S.C. Pure and Applied Maths., Physics and English and French. 1 year Computer, Research in Mathematical Machine and Methods. 5 years Assistant Chief Computer, Research in Applied Economics. At present Head of Computation Department Data Collection and Reduction and theoretical investigations. Seeks post as Head of Computer Department, or Chief Programmer or Senior Programmer. S. England, France, Switzerland or Italy. Salary £2,250 p.a.

Ref. A.358. British. Male. Married. Age 30. B.Sc. (Agric.). Dip. Ag., D.T.A. 1 year Farm labourer. 1½ years Farmer's Assistant. 6 months Head Cowman. 6 years Agricultural Officer, Government. Requries Managerial, Administrative or Advisory post in Agriculture. Anywhere. (Tropical training.) Salary £1,000-£1,250 p.a.

Ref. A.359. British. Male. Single. Age 27. C. and G. Inter Group Course Cert. (Telecoms.). Ordinary Engineering Diploma. 2 years Trainee, telecommunications. 2 year Technician, manual and auto telephony. 1 year Technician, audio transmission, 1 year Technician T.V. Outside Broadcasts. 1 year Main Lines Branch (T.V.). At present Commissioning Engineer, T.V. Radio Links. Seeks post in London—would also consider Canada, U.S.A. or S. America, as Planning Engineer. Salary £1,100 p.a.

Ref. A.360. British. Male. Age 43. A.M.C.T., A.R.I.C. 12 years Assistant Chemist (Analytical), chemical manufacturers. 6 years Works Chemist, tar distillers. 1½ years Senior Assistant Chemist, river board. Seeks post U.K. (not London) as Senior Analyst. Salary £1,500 p.a. min.

Ref. A.361. British. Male. Married. Age 37. Regd. Bacteriologist, Ministry of Health. B.Sc. standard in Bacteriology and Biochemistry. Fellow of the Royal Microscopical Society. 2 year Student Bacteriologist, hospitals. 5 years Bacteriologist and Biochemist, medical branch R.A.F. 5 years Bacteriologist and Biochemist, hospitals. 3 years Public Health and Food Bact. Analyst, American city health department. At present Bacteriologist, Ministry. Seeks post as Bacteriologist in the food or allied industries, with executive or directorship prospects. Liverpool or N.W. England. Salary £900-£1,250 p.a.

American tribute to the APV Plate Evaporator

Land O'Lakes Creamery Manager reports remarkable performance . . .

"45% SOLIDS IN 6 MINUTES"

The first APV Plate Evaporator installed in the U.S.A. was at the Land O'Lakes Creamery, Whitehall, Wisconsin. It has been greeted as an outstanding development in evaporation in a report by Roy Carlson, the Creamery Manager, published in an American Dairy Journal. He says:—

"Would you believe it if I told you that we haven't touched a control button on this new APV Milk Plate Evaporator since the day it was started up a couple of months ago? It's true! And we've been running night and day, seven days a week.

This new evaporator is float-controlled. There are no air controls for us to watch or work. We pre-set the equipment when we hooked it up. And now it runs itself!

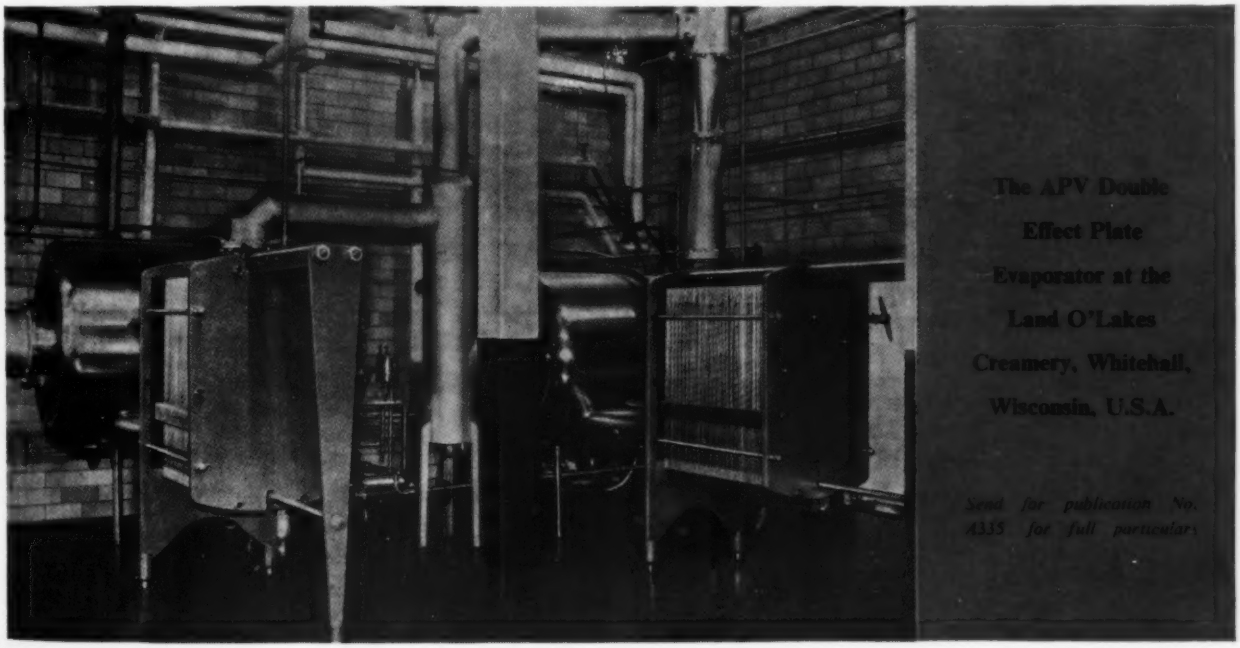
From skim milk to 45% solids takes about six minutes with this evaporator. With other evaporators, this same process takes 25 to 30 minutes.

For efficiency and real operating economy, you just take off or put on more plates. Presently, we are only using 26 plates for each effect. The capacity is 43. So you can see the amazing flexibility available.

Simon Nogosek, my foreman, says he cleans this APV Evaporator in about 45 minutes. Its all equipped for cleaning right in place (C.I.P.). That's a break for his crew, because the other evaporators eat up about two and half hours of time in cleaning.

The old evaporators stand about a storey and a half high. This new APV Evaporator, even at maximum capacity, installs in an area 18′ x 25′ x 9′. We figure we could get about three of the APVs into the same space one of the old evaporators takes up.

This new evaporator easily handles all the work of the old one, and still can do much more. It's only operating at about 70% of its capacity. That's all we can handle in our drying rooms."



The APV Double Effect Plate Evaporator at the Land O'Lakes Creamery, Whitehall, Wisconsin, U.S.A.

Send for publication No. A335 for full particulars

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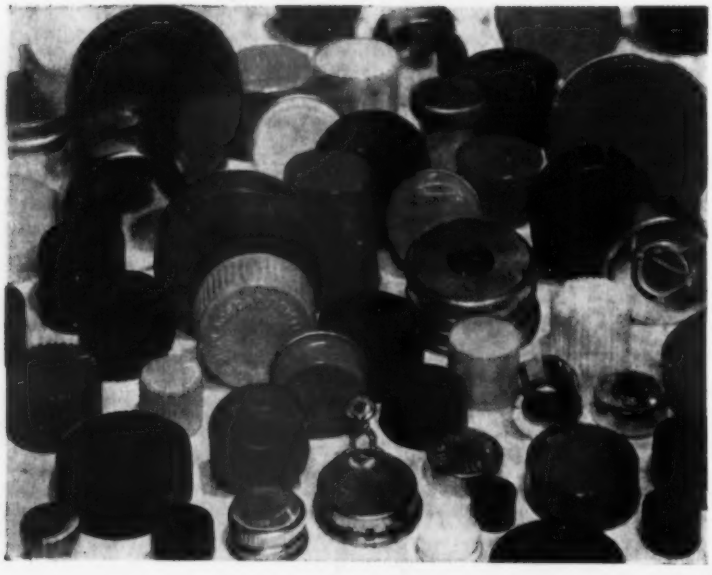

Kork-N-Seal make a wider variety of closures than any other British manufacturer, for glass, metal and plastic containers. They are part of United Glass Ltd., Britain's leading makers of glass containers, so your closures and glass containers can be produced and delivered together.

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